UNITED STATES SIGNAL SERVICE

# MONTHLY WEATHER REVIEW.

VOL. XIX. WASHINGTON CITY, MARCH, 1891. No. 3.

## INTRODUCTION.

This REVIEW is based on reports for March, 1891, from 2,406 regular and voluntary observers. These reports are classified as follows: 171 reports from Signal Service stations; 118 reports from United States Army post surgeons; 1,567 monthly reports from state weather service and voluntary observers; 32 reports from Canadian stations; 183 reports through the Central Pacific Railway Company; 335 marine reports through the co-operation of the Hydrographic Office, Navy Department; marine reports through the "New York Herald Weather Service;" monthly reports from the local weather services of Alabama, Arkansas, Colorado, Illinois, Indiana, Iowa Weather and Crop Service, Kansas, Kentucky, Louisiana, Michigan, Minnesota, Mississippi, Missouri, Nebraska, Nevada, New England, New Jersey, New York, North Carolina, North and South Dakota, Ohio, Oregon, Pennsylvania, South Carolina, Tennessee, Texas, and Wisconsin, and international simultaneous observations. Trustworthy newspaper extracts and special reports have also been used.

## CHARACTERISTICS OF THE WEATHER FOR MARCH, 1891.

The month was the coldest March on record from the lower Missouri valley to central Texas and thence westward to the Rocky Mountains, where the mean temperature was 5° to 8° below the average. The mean temperature was generally below the March average, except over the extreme northeast and southeast parts of the country and on the middle and south Pacific coasts, where the departures above the average temperature were small. The highest temperature reported by a regular station of the Signal Service was 94°, at Rio Grande City, Tex., and by a voluntary observer, 97°, at Fort Ringgold, Tex. The lowest temperature reported by a regular station of the Signal Service was —34°, at Fort Assinniboine, Mont., and by a voluntary observer, —44°, at Rhinelander, Wis. At stations in the Dakotas and north Nebraska the minimum temperature was 2° to 8° lower than previously reported for March. On the 14th and 15th frost was reported generally in the east Gulf states and north Florida, and tender vegetation was reported injured in North Carolina and north Mississippi.

The monthly precipitation was the heaviest ever reported for March at stations in the south part of the middle Atlantic states, in the Carolinas, Tennessee, Upper Michigan, northeast Minnesota, Kansas, Nebraska, east Colorado, north Utah, and west Montana. The precipitation was in excess of the March average, except over the northwest, southwest, and extreme northeast parts of the country, and at Lake Erie stations. On the northeast and middle-eastern slopes of the Rocky Mountains and over the middle plateau region more than double the usual amount of precipitation was reported, and at Key West, Fla., in the extreme northwest, the middle Atlantic states, the Ohio Valley and Tennessee, on the southeast slope of the Rocky Mountains, in the Missouri Valley, the upper lake region, and in the south Atlantic and east Gulf states the monthly precipitation was one-fourth to three-fourths greater than usual. On the south Pacific coast about one-fourth, and on the middle Pacific coast and over the southern and northern plateau regions one-half to three-fourths of the average precipitation for March was reported. Along the middle Atlantic coast and in the south Atlantic and east Gulf states farming operations were retarded by wet weather. The monthly snowfall exceeded 60 inches at Cumbres, Colo.; 50 inches at Blue Knob, Pa., and Summit, Cal.; and 40 inches at Alton, Kans., and Marquette, Mich. At the close of the month a depth of more than 100 inches was reported on the ground at Cumbres, Colo., more than 20 inches at mountain stations in south-central Pennsylvania, northeast West Virginia, Colorado, and northeast lower Idaho, and in upper Michigan.

Destructive local storms were reported at Wheatland, Cal., on the 5th, in western Mississippi, western Tennessee, Louisiana, and South Carolina on the 7th, in Alabama and South Carolina on the 8th, at Hess Road Station, N. Y., on the 13th, in Pike Co., Ga., on the 26th, at Key West, Fla., on the 27th, at Galena, Ill., and in Dickinson Co., Kans., on the 29th, and in Claiborne Co., La., on the 30th. Severe thunder-storms occurred in southeast Massachusetts on the 1st, in Mississippi and Georgia on the 8th, along the Hudson River, N. Y., on the 9th, in Florida and South Carolina on the 21st, on the North Carolina and New Jersey coasts on the 22d, and at Indianapolis, Ind., on the 30th. Destructive general storms occurred in Puget Sound on the 8th; over Long Island Sound and over Lake Ontario on the 13th, when the U. S. S. "Galena" and the tug "Nina" went ashore at Gay Head, Martha's Vineyard; in South Carolina on the 17th. A "norther" prevailed in California and Nevada on the 17–18th. A severe storm prevailed on the New Jersey coast on the 20th; on the North Carolina coast on the 24th, when a vessel was wrecked at Chicamicomico and nineteen persons drowned; on the Virginia coast on the 26th; on the North Carolina and Virginia coasts, over Chesapeake Bay, and on the New Jersey coast on the 27th, when a steamship went ashore near Cape Henry and seven persons were drowned.

The first boat of the season arrived at Albany, N. Y., from New York City on the 25th. The Morris Canal, New Jersey, was open to navigation on the 30th. The first trip of the season between Detroit, Mich., and Cleveland, Ohio, was made by a steamer on the 12th. On the Mississippi River navigation opened at Davenport, Iowa, on the 25th, and the river was clear of ice at Saint Paul, Minn., on the 30th. On the Missouri River navigation opened at Sioux City, Iowa, on the 31st. On the 25th navigation on the Saint Clair River was entirely closed by ice, and on the 30th navigation was resumed. On the 31st lower Lake Huron was covered with floating ice and there

was no indication of a resumption of navigation. On the 29th the first boats of the season arrived at Manistee, Mich., and the channel at Green Bay, Wis., was free from ice.

The lower Mississippi River continued high during the month, and several crevasses were reported in the levees in Mississippi and Louisiana; no serious damage was caused. The middle Ohio river was above the danger-line at the opening of the month, but subsided rapidly. Damaging floods occurred along the Cumberland and Tennessee rivers in Tennessee and along the Savannah River in Georgia, and high water caused damage along the Little Colorado River in Arizona, and along the Sacramento River in California. At Yuma, Ariz., the rivers fell rapidly and railroad communication to the west was resumed on the 4th.

## ATMOSPHERIC PRESSURE (expressed in inches and hundredths).

The distribution of mean atmospheric pressure for March, 1891, as determined from observations taken daily at 8 a. m. and 8 p. m. (75th meridian time), is shown on Chart II by isobars. The departure of the mean pressure for March, 1891, obtained from observations taken twice daily at the hours named, from that determined from hourly observations, varied at the stations named below, as follows:

| Station. | Departure. | Station. | Departure. |
|---|---|---|---|
| Duluth, Minn. | +.001 | Saint Louis, Mo | —.002 |
| Atlanta, Ga. | +.002 | Memphis, Tenn | —.002 |
| Cleveland, Ohio | +.003 | Omaha, Nebr | —.002 |
| Albany, N. Y | +.004 | Bismarck, N. Dak | —.002 |
| Pittsburgh, Pa | +.005 | Saint Paul, Minn | —.004 |
| New York City | +.007 | Moorhead, Minn | —.004 |
| Key West, Fla | +.007 | Denver, Colo | —.005 |
| Eastport, Me | +.009 | Salt Lake City, Utah | —.006 |
| Jacksonville, Fla. | +.009 | Abilene, Tex | —.009 |
| Washington City | +.010 | Santa Fé, N. Mex | —.010 |
| Lynchburgh, Va. | +.011 | San Francisco, Cal. | —.015 |
| Wilmington, N. C | +.014 | El Paso, Tex | —.016 |
| Boston, Mass | +.016 | Fort Assinniboine, Mont. | —.017 |
| Chicago, Ill | .000 | Yuma, Ariz. | —.022 |

The mean pressure was highest over the middle Missouri and Red River of the North valleys, over the east part of the Lake region, in the middle Atlantic and New England states, and from the Pacific coast between the 40th and 45th parallels northeastward over the valley of the Columbia River, where it was above 30.10. East of the Rocky Mountains the mean pressure decreased southward to the Gulf coast, where it was below 30.05, while to the west of the Rocky Mountains the mean pressure decreased from the valley of the Columbia River and west Oregon southward to less than 29.95 over the southern plateau, and northward to less than 30.00 in the British Possessions north of the northern plateau.

A comparison of the pressure chart for March, 1891, with that of the preceding month shows that there was a general increase in mean pressure north of the 40th parallel, save on the northeast slope of the Rocky Mountains, and on the Pacific coast there was an increase in pressure as far south as the 35th parallel. The greatest increase in mean pressure occurred on the north Pacific coast, where it exceeded .20, and the increase exceeded .10 over the north part of the Lake region and thence east over the Saint Lawrence Valley. The most marked decrease in mean pressure occurred along the south Atlantic and east Florida coasts, and at Fort Du Chesne, Utah, where it was more than .10, and the decrease was more than .05 over the east Gulf states, over a great part of the southern plateau, and at stations in the British Possessions north of Montana. In the preceding month the mean pressure was highest along the south Atlantic coast, and lowest on the north Pacific coast, while for the current month it was highest in areas over the northern part of the country from the Atlantic to the Pacific coasts, and lowest over the southern plateau.

The mean pressure was above the normal east of a line traced from the Dakotas to South Carolina, over the northern plateau, and along the Pacific coast north of the 40th parallel; elsewhere it was below the normal. The greatest departure above the normal pressure occurred over the Canadian Maritime Provinces, where it exceeded .20, and on the north Pacific coast it exceeded .05. The most marked departure below the normal pressure occurred over the southern part of the country from Florida to south California, where it was more than .05.

The monthly barometric range at each station of the Signal Service is given in the table of Signal Service data.

### HIGH AREAS AND STORMS.

The general weather conditions of this month have shown two remarkable characteristics, a lowering of temperature below the normal over the whole country, except in northern New England, where it was nearly stationary, and an increase of precipitation, above the normal, over the whole country, except in a few isolated spots. No March in 19 years has shown such departures from the normal. In 1876 there was a similar excess of precipitation, and an examination of the charts shows a marked coincidence in weather conditions for these two months. In 1885 there was also a marked diminution in temperature for nearly the whole country, but the progress of high areas and storms was different from that in this month. We may regard the conditions in 1876 and 1891 as typical, and hence it is of great importance to determine the causes of these anomalies. It should be noted that there has been no change in seasons or in the average conditions of temperature, precipitation, and pressure. The most marked peculiarity in this type, if it may be so regarded, was a tendency for high areas to either remain nearly stationary in the Lake region or to move in paths far to the north. As a consequence the storms made a sweep far to the south, circling this condition of high pressure. The cold north winds blowing into these storms lowered the temperature and at the same time produced the conditions favorable to increased precipitation. It should be noted that both high areas and storms presented very few marked contrasts, and consequently these peculiar characteristics were due to general and not special conditions.

At the close of this description will be found a table giving some of the more important facts relating to high areas and storms, and on Chart I are given storm tracks for this month.

### AREAS OF HIGH PRESSURE.

During the month of March there have been 10 high areas whose paths were well enough defined to be traced. Their average duration was 4.9 days and the mean velocity 28.1 miles per hour, while during this month the storms have had a duration of 4.3 days and a velocity of 27.6 miles per hour. Of these high areas VIII started in Texas and IX on the middle Pacific coast. The other eight first appeared to the north of Montana. No. IV disappeared in Texas, IX in Ohio, X in the Saint Lawrence Valley, and the other seven reached the Atlantic coast.

I.—This was a continuation of VI of February. It was central over Lake Erie on the 1st and moved northeast, passing into the Gulf of Saint Lawrence on the 4th. A pressure of 30.78 and temperature of —42° were reported from White River, Ont., but only a few stations in the extreme north reported temperature below zero during its passage.

II.—On the first day of the month this high area had just appeared at Edmonton, N. W. T., where the pressure was 30.68 and temperature —18°. Its track was a very little south of east to Lake Huron and then east-northeast to the Atlantic off Nova Scotia. The lowest temperatures ever observed during the first ten days of March were reported during its progress on the 2d and 3d in Montana, Dakota, and northern Nebraska. At Fort Assinniboine, Mont., —32°, or 6° below the lowest; Bismarck, N. Dak., —32°, or 12° below; Valentine, Nebr., —26°, or 10°

below. Temperatures below zero occurred as far south as Kansas, and below freezing over the entire country east of the Rocky Mountains, except the south Atlantic and east Gulf states and on the west Gulf coast. Highest pressure reported was 30.76, at Swift Current, N. W. T., 3d, and lowest temperature, —42°, at Prince Albert, N. W. T., 5th. This had the slowest motion of any in the month and its duration, 9.5 days, was the longest.

III.—A stationary area of high pressure occurred from the 5th to the 8th just north of North Dakota. The effects of this high area will be described under "Storms." Connected with this an area of high pressure started just to the west on the 6th, and moving southeast reached Texas on 9th. Thence the path was nearly due northeast to Newfoundland on the 13th. The track was the longest of all this month.

IV.—This high area started in the same place as III and moved southeast to Texas, where it lost its identity or joined with V afternoon of 13th.

V.—Started a day later from the same spot as the last and moved nearly southeast reaching the Atlantic off the Carolina coast 16th.

VI.—Started a little north of V and moving east-southeast reached the New Jersey coast on 17th; thence it moved along the coast to Nova Scotia 18th.

VII.—Started in Manitoba on the 17th and moved nearly east reaching Newfoundland on the 21st.

VIII.—This is the only high area of the month that had its origin within this country. It was first noted in north Texas on 19th and moved a little south of east, reaching the Florida coast on 21st.

IX.—This was first noted off the middle Pacific coast on the 19th. Moving southeast it reached Texas on the 21st; thence it moved northeast, disappearing in Ohio on 23d.

X.—This started to the north of Montana morning of 22d and moving a little south of east it disappeared in the Saint Lawrence Valley on 27th.

## STORMS.

The average velocity of the 13 storms traced this month has been 27.6 miles per hour, which is 4.2 miles below the average for the past 19 years. It stands 5th on the list, 1876, 1878, 1881, and 1879 only being below. It is an interesting fact that the storms of 1876 had a corresponding low velocity, and this may, in part, account for the increased precipitation. It may also be noted that the driest year of the 19 was 1885, and this stands 3d in the list of high velocities. The following table shows the average velocity during the 19 years from 1873 to 1891:

| Year. | Velocity. | Number. | Year. | Velocity. | Number. |
|---|---|---|---|---|---|
| 1873 | 29.7 | 12 | 1883 | 38.0 | 11 |
| 1874 | 30.4 | 11 | 1884 | 33.3 | 12 |
| 1875 | 32.1 | 10 | 1885 | 36.0 | 9 |
| 1876 | 26.6 | 9 | 1886 | 31.0 | 14 |
| 1877 | 34.5 | 11 | 1887 | 31.0 | 11 |
| 1878 | 24.3 | 10 | 1888 | 34.5 | 9 |
| 1879 | 35.2 | 13 | 1889 | 25.8 | 10 |
| 1880 | 35.8 | 14 | 1890 | 37.0 | 12 |
| 1881 | 26.8 | 9 | 1891 | 27.6 | 13 |
| 1882 | 34.8 | 10 | Mean | 31.8 | 11 |

I.—On the 1st a storm of some intensity appeared on the middle Pacific coast. A portion of this storm seems to have been transferred to the east-middle Rocky Mountain slope p. m. of this date, and the precipitation extended in its front to Wisconsin and Illinois. In the next 24 hours the storm remained almost stationary while the precipitation extended in a remarkable manner clear to the Atlantic coast, and, in fact, into the high area I, already described. High area II, to the north of Montana, seems to have had some influence upon the precipitation. In the next 24 hours this storm made a rapid advance in a curve, passing to the north of Louisiana and on to the lower lakes. In the next 12 hours gales were experienced in the Lake region, amounting to 52 miles per hour at Buffalo, N. Y. This storm was last noted in Ontario p. m. of 4th.

II.—There seems to have been a division in I, or a development of a secondary from it, on the middle Atlantic coast a. m. of the 3d. This storm increased very rapidly in energy as it passed up the coast, the pressure falling from 30.1 to 29.1 in 2 days. A maximum velocity of 56 miles per hour was experienced at Sandy Hook, N. J., and Block Island, R. I., 4th.

III.—Originated in the south plateau region and had very slight energy for 48 hours. On the a. m. of 5th a secondary appeared to develop in the west Gulf, and from this the precipitation rapidly extended over nearly the whole country with very slight motion in the storm. By far the heaviest precipitation of the month was noted while this storm remained nearly stationary in the west Gulf. At Vicksburg, Miss., 5.42 fell in the 24 hours ending p. m. of 7th, and 4.14 in 12 hours ending at the same time. This storm was undoubtedly held back by the high areas in Canada, but it is hardly probable that any cool winds from there assisted in producing the excessive precipitation. From the a. m. of 6th to p. m. of 7th there was nearly continuous precipitation over a large part of the country. On a. m. of 8th this storm had moved to Illinois and in the succeeding 12 hours it divided the wide extended high area to the north and disappeared to the north of Lake Superior on 9th.

IV.—A secondary from the above storm split off during the 8th in the middle Gulf and moved rapidly to the Saint Lawrence Valley, where it disappeared on the 10th. High area III followed up this storm and dominated the weather in the Eastern States till a. m. of 11th.

V.—This storm originated in N. W. T. on 8th. The origin of this storm was remarkable in the fact that though the pressure fell to 29.12 and there were very steep gradients, producing winds which reached 46 miles per hour, yet there was almost no precipitation in the first 72 hours, or until a secondary (VI) had moved with some rapidity to the southwest. These conditions, so extremely different from those prevailing only a few hours before, demand a special study and treatment, which cannot be given here. It should be noted, however, that the position of the storm and high area in this case was almost opposite to that in III. With the great precipitation there was little or no movement of the storm, which had very slight intensity and was situated in the west Gulf, while a high area of great magnitude stretched across almost the whole north boundary of the country. On the other hand, with little or no precipitation, a storm of great intensity and extent was situated in the Northwest, with a high area of great magnitude dominating the weather conditions throughout the states east of the 100th meridian. It has been repeatedly observed that this latter distribution of pressure is very favorable to fair skies throughout the country. The evidence from these storms, corroborated by that from scores of others, seems to prove almost conclusively that precipitation is not needed to develop storms of great extent and intensity. As noted above, a secondary from V split off on the 10th and the two moved as a trough of low pressure toward the east, continuing their identity till 12th p. m., when the trough extended from Lake Superior to the middle Atlantic coast.

VII.—A secondary seems to have formed from the above trough over the middle Gulf states on the 12th, and 12 hours later all three storms are included in a single storm of great extent and intensity, with a pressure of 29.40 at Parkersburgh, W. Va. The conditions were considered so threatening that on the afternoon of the 12th, although no high winds were prevalent, information signals were hoisted along the middle Atlantic and south New England coasts, and these were changed to cautionary that night. On the next day the storm reached the New England coast, and at 10.30 p. m. of the 13th the U. S. S. "Galena" and tug "Nina" went ashore on Gay Head. This storm moved ne. down the Saint Lawrence Valley and disappeared on the 14th. The pressure at Rockliffe, Ont., 28.98, p. m. of the 13th, was the lowest reported at any station during the entire month. High area VI followed in the wake of this storm and dominated the weather for 48 hours.

VIII.—This storm appeared in the rear of high area VI in the Northwest Territory on the 13th. It skirted the high area on the north side and passed along the north border of the country with almost no precipitation, and disappeared in the Gulf of Saint Lawrence on 17th.

IX.—Appeared on the extreme north Pacific coast on 14th. Its motion was se. to Indian Territory on 17th, then ne. to Lake Erie, where it disappeared 20th.

X.—This storm started on 17th to the north of Montana, and moved se. to Missouri 20th. It then moved e. to the middle Atlantic coast, where it disappeared 23d.

XI.—This storm originated like the last three in or near the Northwest Territory. Its motion was in a gentle curve to the south, reaching the Saint Lawrence Gulf on the 25th. Almost no precipitation attended its progress.

XII.—Originated in the south plateau region on the 22d. It moved east to the middle Gulf on the 26th, then turned due north and disappeared over Ohio on the 28th. A secondary from this storm, a. m. of the 27th, was the beginning of a storm which is described among "North Atlantic Storms."

XIII.—This storm also began in the N. W. T. on the 25th. It moved se. to Indian Territory on the 29th, then northeast and was noted on the last day of the month over Lake Michigan. This storm was also remarkably dry in its inception. The lowest pressure was 29.42 on the first few days and maximum winds of 36 and 40 miles were reported from several stations.

*Tabulated statement showing principal characteristics of areas of high and low pressure.*

| Barometer. | First observed. | | | Last observed. | | Duration. | Velocity per hour. | Maximum pressure change and maximum abnormal temperature change in twelve hours and maximum wind velocity. | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Date. | Lat. N. | Long. W. | Lat. N. | Long. W. | | | Station. | Rise. | Date. | Station. | Fall. | Date. | Station. | Direction. | Miles per hour. | Date. |
| High areas. | | ° | ° | ° | ° | *Days.* | *Miles.* | | *Inch.* | | | ° | | | | | |
| I | * | 50 | 109 | 48 | 64 | 5·5 | 25 | Montreal, Que | ·46 | 1 | Eastport, Me | 21 | 1 | Block Island, R. I | ne. | 32 | 3 |
| II | 1 | 55 | 113 | 46 | 57 | 9·5 | 16 | Parry Sound, Ont | ·42 | 5 | Cheyenne, Wyo | 43 | 2 | Oswego, N. Y | nw. | 26 | 5 |
| III | 6 | 51 | 119 | 49 | 54 | 7·5 | 30 | Norfolk, Va | ·62 | 10 | Palestine, Tex | 29 | 7 | Kitty Hawk, N. C | n. | 34 | 10 |
| IV | 10 | 51 | 117 | 31 | 96 | 3·0 | 26 | Fort Buford, N. Dak | ·72 | 10 | Denver, Colo | 38 | 10 | Galveston, Tex | n. | 38 | 13 |
| V | 11 | 50 | 114 | 33 | 73 | 5·0 | 27 | Parkersburgh, W. Va | ·60 | 13 | Wilmington, N. C | 17 | 15 | Kitty Hawk, N. C | nw. | 38 | 15 |
| VI | 15 | 54 | 108 | 44 | 60 | 3·5 | 38 | White River, Ont | ·72 | 16 | Saint Vincent, Minn | 22 | 15 | do | ne. | 44 | 17 |
| VII | 17 | 51 | 92 | 48 | 56 | 3·5 | 30 | Father Point, Que | ·50 | 19 | Rockliffe, Ont | 24 | 19 | Winnipeg, Man | ne. | 20 | 17 |
| VIII | 19 | 36 | 100 | 29 | 80 | 2·0 | 36 | Little Rock, Ark | ·24 | 19 | Cairo, Ill | 15 | 19 | Wichita, Kans | n. | 26 | 19 |
| IX | 19 | 42 | 124 | 40 | 84 | 4·0 | 35 | Abilene, Tex | ·42 | 21 | Abilene, Tex | 20 | 21 | Abilene, Tex | n. | 36 | 21 |
| X | 22 | 53 | 109 | 49 | 71 | 5·5 | 18 | Fort Buford, N. Dak | ·46 | 22 | Minnedosa, Man | 22 | 22 | Block Island, R. I | n. | 36 | 26 |
| Mean | | | | | | 4·9 | 28 | | ·52 | | | 25 | | | | 33 | |
| Low areas. | | | | | | | | | Fall. | | | Rise. | | | | | |
| I | 1 | 43 | 121 | 46 | 77 | 3·5 | 39 | Parry Sound, Ont | ·42 | 4 | Montgomery, Ala | 15 | 3 | Buffalo, N. Y | sw. | 52 | 4 |
| II | 3 | 35 | 75 | 49 | 57 | 3·0 | 21 | Sydney, C. B. I | ·56 | 5 | Montreal, Que | 14 | 3 | Block Island, R. I | e. | 64 | 4 |
| III | 3 | 38 | 115 | 51 | 83 | 6·0 | 23 | Port Arthur, Ont | ·56 | 8 | Atlanta, Ga | 17 | 8 | Chicago, Ill | e. | 48 | 8 |
| IV | 8 | 28 | 94 | 49 | 64 | 2·5 | 39 | Eastport, Me | ·38 | 10 | Northfield, Vt | 14 | 9 | Boston, Mass | w. | 46 | 10 |
| V | 8 | 50 | 115 | 50 | 82 | 3·5 | 23 | Fort Buford, N. Dak | ·50 | 9 | Rapid City, S. Dak | 26 | 9 | Fort Buford, N. Dak | nw. | 48 | 10 |
| VI | 10 | 42 | 105 | 36 | 76 | 2·5 | 40 | Norfolk, Va | ·36 | 12 | Augusta, Ga | 16 | 12 | Fort Sill, Okla. T | s. | 48 | 10 |
| VII | 12 | 32 | 88 | 50 | 67 | 2·0 | 36 | Rockliffe, Ont | ·78 | 13 | New Orleans, La | 14 | 12 | Buffalo, N. Y | sw. | 60 | 13 |
| VIII | 13 | 48 | 126 | 48 | 60 | 4·0 | 32 | Minnedosa, Man | ·60 | 14 | Fort Buford, N. Dak | 33 | 14 | Chicago, Ill | w. | 52 | 15 |
| IX | 14 | 48 | 127 | 42 | 81 | 6·0 | 22 | do | ·42 | 16 | Swift Current, N. W. T | 24 | 16 | do | sw. | 48 | 17 |
| X | 17 | 52 | 117 | 37 | 72 | 5·5 | 23 | Valentine, Nebr | ·36 | 19 | Moorhead, Minn | 20 | 19 | Kitty Hawk, N. C | e. | 56 | 22 |
| XI | 20 | 53 | 117 | 47 | 63 | 4·5 | 26 | Rapid City, S. Dak | ·40 | 21 | Rapid City, S. Dak | 20 | 21 | Fort McKinney, Wyo | nw. | 48 | 21 |
| XII | 22 | 35 | 111 | 41 | 84 | 6·0 | 16 | Manistee, Mich | ·28 | 26 | Shreveport, La | 13 | 24 | Chicago, Ill | ne. | 42 | 25 |
| XIII | 25 | 51 | 122 | 46 | 87 | 6·5 | 19 | Green Bay, Wis | ·42 | 30 | Palestine, Tex | 21 | 27 | do | se. | 52 | 30 |
| Mean | | | | | | 4·3 | 28 | | ·46 | | | 19 | | | | 51 | |

* February 26.

## NORTH ATLANTIC STORMS FOR MARCH, 1891 (pressure in inches and millimetres; wind-force by Beaufort scale).

The paths of the depressions that appeared over the west part of the north Atlantic Ocean during March, 1891, are shown on Chart I. These paths have been determined from international observations by captains of ocean steamships and sailing vessels received through the co-operation of the Hydrographic Office, Navy Department, and the "New York Herald Weather Service."

The barometric pressure continued high over mid-ocean during the first decade of the month, although it was unusually low near the Azores from the 5th to 9th. The first important storm of the month was central off the southwest edge of the Grand Banks the morning of the 4th, with fresh to strong gales and a heavy snow storm over south Newfoundland. On the morning of this date a storm of considerable strength was off the south New England coast. At night a sw. gale, with squalls and lightning, prevailed at Bermuda. On the 5th the two storms referred to had apparently united and a storm of marked energy was central southeast of Nova Scotia, with pressure about 29.30 (744), heavy gales and sleet, and heavy rain over south Newfoundland. The morning of the 6th the storm was central over or near the east extremity of Nova Scotia, with pressure below 29.40 (747) and fresh to strong gales, from which position it moved east and on the 7th was central southeast of Newfoundland, after which it moved south of east in the direction of the Azores. On the 8th a storm was central south of Newfoundland, whence it apparently moved southeast and united with an area of low pressure which extended southwest of the Azores from the 5th to the middle part of the month. On the 7th there had been a decided fall in pressure over the British Isles. On the 8th an area of low pressure extended from the British Isles over the Azores. On the 9th a storm of considerable strength, with central pressure about 29.40 (747), was central over the west part of the Bay of Biscay, with severe gales and a heavy snow storm over the south part of Great Britain, where railroad and telegraphic communication was interrupted, and many disasters to shipping were reported. By the 10th the storm-centre had moved eastward over the Bay of Biscay; the heavy storm continued over the south of England, blocking trains with snow, and causing great damage to shipping in the English Channel. Following this storm a severe cold spell set in over England, greatly interfering with the clearing of snow from railroad tracks, and causing loss of life and live stock. From the 11th to 13th a second storm of considerable strength moved eastward from the 20th meridian over the Bay of Biscay. From the 14th to 16th a storm moved eastward from the lower Saint Lawrence valley to the 45th meridian. On the 17th this storm was central about midway between Newfoundland and the Azores; by the 18th it was apparently central near the Azores; by the 19th it had moved east-northeast of the Azores; and by

the 20th had apparently passed eastward over the Bay of Biscay. The evening of the 15th a storm appeared over the west part of the Gulf of Mexico, and by the following evening had moved eastward to the Florida Peninsula. On the 17th a storm of considerable strength was central over the Gulf of Saint Lawrence, whence it moved northeast and disappeared north of the region of observation. On the 19th and 20th a storm of small energy was central off the south Atlantic coast. By the 21st this storm had moved ne. to about the 38th parallel, and by the 22d it had apparently been forced southwest toward the coast by high pressure to the east and northeast. By the 23d this depression had apparently moved southeast and united with a storm which had advanced northwestward to west of Bermuda. On this date a se. hurricane was reported at Bermuda, with pressure falling to 29.54 (750) at 4 p. m., fierce squalls, lightning, and rain. During the 23d and 24th this storm recurved north and northeast to the west of Bermuda, where the barometer fell to 29.43 (748) on the 24th. By the 25th the storm-centre had moved northeast north of Bermuda to the 60th meridian, and at noon of that date the barometer read 29.70 (754) at Bermuda, with a north gale, and squally and hazy weather. The morning of the 26th this storm was located south of the Grand Banks, and a second storm was central over the Gulf of Saint Lawrence, and by the morning of the 27th the two storms had apparently united off the northeast edge of the Grand Banks, after which the storm disappeared north of the region of observation. On the 27th and 28th a storm of moderate strength moved northeast off the south and middle Atlantic coasts, with an apparent increase in energy during the 28th. During the 29th and 30th the storm moved east and north of east, and on the latter-named date it was central off the southeast edge of the Banks of Newfoundland. On the last day of the month this storm was apparently central on the west edge of the Grand Banks, without evidence of marked energy. On the 30th and 31st a storm moved eastward over the ocean in high latitudes, and on the 31st its approach toward the British Isles was indicated by reports from the west of Ireland.

### FOG IN MARCH.

The limits of fog-belts on the north Atlantic Ocean west of the 40th meridian, as reported by shipmasters, are shown on Chart I by dotted shading. Fog was reported east of the 55th meridian on 7 dates; between the 55th and 65th meridians on 4 dates; and west of the 65th meridian on 2 dates. Compared with the corresponding month of the last 3 years the dates of occurrence of fog near the Grand Banks for the current month numbered 7 less than the average; between the 55th and 65th meridians 5 less than the average; and west of the 65th meridian 4 less than the average. The fog generally occurred with the approach or passage of general storms. On the 9th a dense fog prevailed over Chesapeake Bay and along the New Jersey coast attending the passage of a general storm of pronounced strength from the Lake region over the Saint Lawrence Valley. On the 21st dense fog prevailed at Boston, Mass., with the passage of a general storm over the Saint Lawrence Valley. Dense fog was also reported at points along the New England, New York, and New Jersey coasts on the 9th, 12th to 14th, and 20th to 24th with the approach of general storms whose influence extended off the coast.

### OCEAN ICE IN MARCH.

The following table shows the southern and eastern limits of the region within which icebergs or field ice were reported for March during the last 10 years:

| Southern limit. | | | Eastern limit. | | |
|---|---|---|---|---|---|
| Month. | Lat. N. | Long. W. | Month. | Lat. N. | Long. W. |
| | ° ′ | ° ′ | | ° ′ | ° ′ |
| March, 1882 | 42 30 | 50 00 | March, 1882 | 46 30 | 46 00 |
| March, 1883 | 41 46 | 49 48 | March, 1883 | 48 40 | 43 03 |
| March, 1884 | 41 20 | 54 06 | March, 1884 | 45 00 | 40 15 |
| March, 1885 | 40 55 | 49 04 | March, 1885 | 45 57 | 43 15 |
| March, 1886 | 40 20 | 49 02 | March, 1886 | 47 20 | 44 40 |
| March, 1887 | 41 00 | 49 07 | March, 1887 | 45 31 | 42 56 |
| March, 1888 | 42 30 | 50 37 | March, 1888 | 47 23 | 46 56 |
| March, 1889 | 44 20 | 53 00 | March, 1889 | 44 20 | 53 00 |
| March, 1890 | 41 01 | 50 54 | March, 1890 | 46 40 | 39 50 |
| March, 1891 | 42 25 | 50 30 | March, 1891 | 49 00 | 43 44 |
| Mean | 41 48 | 50 36 | Mean | 46 38 | 44 31 |

The limits of the region within which icebergs or field ice were reported for March, 1891, are shown on Chart I by ruled shading.

The southernmost ice reported, small bergs and pack ice on the 20th in the position given, was about ½° north of the average southern limit of ice, and the easternmost ice reported, an ice field and bergs on the 24th in the position given, was less than 1° east of the average eastern limit of ice for March. The ice reported was generally confined to the east edge of the Banks of Newfoundland, although it was noted as far west as the east coast of Newfoundland. Compared with March of preceding years the Arctic ice reported for the current month about equaled the average in quantity and distribution. In March, 1889, no icebergs were reported, and the only field ice reported was observed in N. 44° 20′, W. 53° on the 2d.

## TEMPERATURE OF THE AIR (expressed in degrees, Fahrenheit).

Many of the voluntary stations do not have standard thermometers or shelters.

The distribution of mean temperature over the United States and Canada for March, 1891, is exhibited on Chart II by dotted isotherms. In the table of Signal Service data the monthly mean temperature and the departure from the normal are given for regular stations of the Signal Service. The figures opposite the names of the geographical districts in the columns for mean temperature and departure from the normal show, respectively, the averages for the several districts. The normal for any district may be found by adding the departure to the current mean when the departure is below the normal and subtracting when above. The monthly mean temperature for regular stations of the Signal Service represents the mean of the maximum and minimum temperatures.

The mean temperature was highest over extreme south Florida, where it was above 70, and it was above 60 along the immediate Gulf coast and in adjoining parts of Arizona and California. The mean temperature was above 50 generally in the east and west Gulf states, southwest and west Arizona, and in California, except in the northeast part. The lowest mean temperature was noted in Manitoba and in extreme north Ontario, where it was below 10, and it was below 20 over the north part of the upper lake region, and thence westward over northeast Montana, and at elevated stations in Colorado.

The mean temperature was below the normal, except from the north part of the upper lake region eastward over the Saint Lawrence Valley and north New England, at stations on the south New England coast, in extreme south Florida, and on the middle and south Pacific coasts. The greatest departure below the normal temperature occurred on the middle-eastern and northeast slopes of the Rocky Mountains, where it was more than 8, and the departure below the normal was more than 4 over a greater part of the interior of the country between the Mississippi River and the Pacific coast ranges of mountains. The most marked departure above the normal temperature was noted in east Ontario, Quebec, and New Brunswick, where it was more than 3. In other districts where the temperature was above the normal the departure was less than 1.

In Montana, North and South Dakota, and northern Nebraska the nights of the 2d and 3d were the coolest on record for the season in those districts, the minimum temperature being 2 to 12 lower than previously reported for the first decade of March. On the 2d a severe cold wave extended over New York and New England. From the 2d to 5th a cold wave prevailed in Oregon and Washington. In east Oregon and Washington the temperature fell 6 to 15 below zero, and was generally 10 to 40 below the normal in those states. On the morning of the 4th the temperature was below zero in Minnesota, west Iowa, and north Kansas, and thence northwest to the Northwest Territory, and was below freezing over the entire country east of the Rocky Mountains, except in the south Atlantic and east Gulf states and on the west Gulf coast.

The seasonal temperature, January to March, inclusive, averaged about as follows: in the extreme northwest the seasonal temperature was about 4 in excess; in New England and the upper lake region about 3 in excess; in the middle Atlantic states and lower lake region about 2 in excess; and in the south Atlantic states, Rio Grande Valley, Ohio Valley and Tennessee, the upper Mississippi valley, and over the upper plateau region it was about 1 in excess of the average. Over the middle plateau region there was a deficiency of about 3; and on the northeast and middle-eastern slopes of the Rocky Mountains and over the southern plateau region the seasonal deficiency was about 2. In the east and west Gulf states, at Key West, Fla., in the Missouri Valley, on the southeast slope of the Rocky Mountains, and along the Pacific coast the seasonal departure was less than 1.

The highest mean temperature ever reported for March was noted on the north Pacific coast and in the middle Missouri and Red River of the North valleys in 1889, when the mean temperature was 4 to 5 above the normal on the north Pacific coast and 6 to 17 above in the middle Missouri valley; over the southeast part of the plateau region and thence eastward over Texas and Louisiana in 1879, when the mean temperature was 4 to 7 above the normal; and generally over the country east of the Mississippi River and on the middle-eastern slope of the Rocky Mountains in 1878, when the mean temperature was 5 to 8 above the normal on the middle-eastern slope of the Rocky Mountains, in the lower Missouri and middle Mississippi valleys, and over the north part of the Gulf States, 10 to 15 above in the upper Mississippi valley, 6 to 10 above in the Ohio Valley and Tennessee, 10 to 15 above in the Lake region, and 5 to 10 above in the middle and south Atlantic and New England states.

The lowest mean temperature ever reported in March was noted from south Iowa southward to central Texas and thence westward to the Rocky Mountains in 1891, when the mean temperature was 5 to 8 below the normal; from Minnesota westward over Montana in 1888, when the mean temperature was 5 to 11 below the normal; in the lower Rio Grande valley in 1888, when the mean temperature was 3 to 6 below the normal; over the southeast part of the plateau region in 1886, when the mean temperature was 3 to 5 below the normal; generally east of the 87th meridian, except on the New England and south Atlantic coasts in 1885, when the mean temperature was 7 to to 10 below in the Lake region and the upper Ohio valley, 4 to 7 below in the east Gulf states, and 5 to 10 below in the middle and south Atlantic states and New England; along the Pacific coast in 1880, when the mean temperature was 5 to 9 below the normal; in the middle Mississippi and lower Ohio valleys and at stations on the New England and south Atlantic coasts in 1872, when the mean temperature was 5 to 8 below the normal in the middle Mississippi valley, 7 to 8 below on the New England coast, and 5 to 6 below on the south Atlantic coast.

### DEVIATIONS FROM NORMAL TEMPERATURE.

The following table shows for certain stations, as reported by voluntary observers, (1) the normal temperature for March for a series of years; (2) the length of record during which the observations have been taken, and from which the normal has been computed; (3) the mean temperature for March, 1891; (4) the departure of the current month from the normal; (5) and the extreme monthly mean for March, during the period of observation and the years of occurrence:

| State and station. | County. | (1) Normal for the month of Mar. | (2) Length of record. | (3) Mean for Mar., 1891. | (4) Departure from normal. | (5) Extreme monthly mean for Mar. | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Highest. | Year. | Lowest. | Year. |
| *Arkansas.* | | ° | Years | ° | ° | ° | | ° | |
| Lead Hill | Boone | 48.4 | 9 | 45.0 | − 3.4 | 55.4 | 1882 | 45.0 | 1891 |
| *California.* | | | | | | | | | |
| Sacramento | Sacramento | 54.7 | 38 | 51.7 | − 3.0 | 59.8 | 1853 | 48.8 | 1880 |
| *Connecticut.* | | | | | | | | | |
| Middletown | Middlesex | 32.4 | 22 | 34.3 | + 1.9 | 40.7 | 1871 | 25.7 | 1872 |
| *Florida.* | | | | | | | | | |
| Merritt's Island | Brevard | 65.9 | 9 | 68.4 | + 2.5 | 71.4 | 1882 | 61.6 | 1889 |
| *Georgia.* | | | | | | | | | |
| Forsyth | Monroe | 56.8 | 17 | 53.7 | − 3.1 | 61.7 | 1880, '82 | 51.4 | 1885 |
| *Illinois.* | | | | | | | | | |
| Peoria | Peoria | 38.3 | 35 | 34.3 | − 4.0 | 45.8 | 1871 | 29.4 | 1867 |
| Riley | McHenry | 31.2 | 34 | 28.0 | − 3.2 | 41.7 | 1878 | 23.8 | 1872 |
| *Indiana.* | | | | | | | | | |
| Vevay | Switzerland | 42.6 | 24 | 40.1 | − 2.5 | 50.7 | 1878 | 35.7 | 1885 |
| *Iowa.* | | | | | | | | | |
| Cresco | Howard | 26.1 | 19 | 23.3 | − 2.8 | 42.3 | 1878 | 19.6 | 1888 |
| Monticello | Jones | 32.0 | 37 | 27.0 | − 5.0 | 45.8 | 1878 | 23.8 | 1867 |
| Logan | Harrison | 35.0 | 17 | 29.9 | − 5.1 | 48.0 | 1878 | 28.3 | 1875 |
| *Kansas.* | | | | | | | | | |
| Lawrence | Douglas | 42.1 | 27 | 35.1 | − 7.0 | 51.2 | 1868 | 34.2 | 1876 |
| Wellington | Sumner | 43.9 | 12 | 38.2 | − 5.7 | 49.6 | 1879 | 38.2 | 1891 |
| *Louisiana.* | | | | | | | | | |
| Grand Coteau | Saint Landry | 61.8 | 8 | 59.6 | − 2.2 | 66.2 | 1884 | 59.5 | 1885 |
| *Maine.* | | | | | | | | | |
| Orono | Penobscot | 27.4 | 21 | 28.9 | + 1.5 | 34.6 | 1871 | 19.1 | 1885 |
| *Maryland.* | | | | | | | | | |
| Cumberland | Allegany | 37.0 | 32 | 35.9 | − 1.1 | 46.0 | 1878 | 30.0 | 1875 |
| *Massachusetts.* | | | | | | | | | |
| Amherst | Hampshire | 32.7 | 55 | 35.9 | + 3.2 | 40.5 | 1871 | 24.5 | 1843 |
| Newburyport | Essex | 32.2 | 11 | 32.9 | + 0.7 | 36.7 | 1889 | 27.0 | 1885 |
| Somerset | Bristol | 34.2 | 18 | 35.8 | + 1.6 | 39.8 | 1878 | 28.2 | 1885 |
| *Michigan.* | | | | | | | | | |
| Kalamazoo | Kalamazoo | 31.1 | 15 | 31.6 | + 0.5 | 42.2 | 1878 | 22.5 | 1885 |
| Thornville | Lapeer | 30.7 | 14 | 30.0 | − 0.7 | 41.1 | 1878 | 21.0 | 1885 |
| *Minnesota.* | | | | | | | | | |
| Minneapolis | Hennepin | 24.8 | 26 | 23.4 | − 1.4 | 43.6 | 1878 | 11.6 | 1867 |
| *Montana.* | | | | | | | | | |
| Fort Shaw | Lewis & Clarke | 33.1 | 20 | 28.0 | − 5.1 | 41.8 | 1889 | 21.7 | 1870 |
| *New Hampshire.* | | | | | | | | | |
| Hanover | Grafton | 27.8 | 57 | 28.6 | + 0.8 | 35.5 | 1871 | 19.0 | 1872, '75 |
| *New Jersey.* | | | | | | | | | |
| Moorestown | Burlington | 37.5 | 28 | 36.6 | − 0.9 | 45.4 | 1871 | 29.7 | 1885 |
| South Orange | Essex | 35.7 | 19 | 35.4 | − 0.3 | 42.5 | 1878 | 28.5 | 1872 |
| *New York.* | | | | | | | | | |
| Cooperstown | Otsego | 27.4 | 37 | 28.8 | + 1.4 | 37.2 | 1871 | 18.3 | 1885 |
| Palermo | Oswego | 27.2 | 31 | 31.2 | + 4.0 | 38.1 | 1878 | 17.1 | 1885 |
| *North Carolina.* | | | | | | | | | |
| Lenoir | Caldwell | 45.5 | 17 | 43.0 | − 2.5 | 51.6 | 1878 | 35.0 | 1877 |
| *Ohio.* | | | | | | | | | |
| N'th Lewisburgh | Champaign | 37.7 | 59 | 33.5 | − 4.2 | 48.0 | 1842 | 21.0 | 1843 |
| Wauseon | Fulton | 30.9 | 22 | 30.8 | − 0.1 | 43.2 | 1878 | 24.5 | 1885 |
| *Oregon.* | | | | | | | | | |
| Albany | Linn | 47.4 | 11 | 42.8 | − 4.6 | 53.0 | 1885 | 40.4 | 1880 |
| Eola | Polk | 45.4 | 21 | 41.8 | − 3.6 | 54.2 | 1884 | 38.8 | 1880 |
| *Pennsylvania.* | | | | | | | | | |
| Dyberry | Wayne | 28.6 | 26 | 30.2 | + 1.6 | 36.9 | 1878 | 19.5 | 1885 |
| Grampian Hills | Clearfield | 30.5 | 26 | 30.1 | − 0.4 | 40.4 | 1878 | 20.1 | 1885 |
| Wellsborough | Tioga | 31.0 | 11 | 31.2 | + 0.2 | 37.6 | 1882 | 22.4 | 1885 |
| *South Carolina.* | | | | | | | | | |
| Statesburgh | Sumter | 53.0 | 10 | 50.4 | − 2.6 | 59.0 | 1882 | 48.3 | 1885 |
| *Tennessee.* | | | | | | | | | |
| Austin | Wilson | 47.4 | 20 | 47.6 | + 0.2 | 57.3 | 1868 | 40.8 | 1876 |
| *Texas.* | | | | | | | | | |
| New Ulm | Austin | 62.4 | 18 | 57.3 | − 5.1 | 63.9 | 1879 | 51.8 | 1888 |
| *Vermont.* | | | | | | | | | |
| Strafford | Orange | 26.0 | 18 | 27.5 | + 1.5 | 33.8 | 1878 | 17.2 | 1883 |
| *Virginia.* | | | | | | | | | |
| Birdsnest | Northampt'n | 45.2 | 22 | 42.3 | − 2.9 | 54.1 | 1878 | 35.8 | 1872 |
| *Washington.* | | | | | | | | | |
| Fort Townsend | Jefferson | 44.7 | 18 | 41.8 | − 2.9 | 50.7 | 1885 | 38.7 | 1880 |
| *Wisconsin.* | | | | | | | | | |
| Madison | Dane | 30.0 | 26 | 26.2 | − 3.8 | 37.1 | 1889 | 23.2 | 1888 |

### MAXIMUM AND MINIMUM TEMPERATURES.

The highest maximum temperature reported by a regular station of the Signal Service was 94, at Rio Grande City, Tex., and the maximum temperature was above 80 over the Florida Peninsula, over a greater part of Texas, the southern part of Indian Territory, in west Arizona, extreme south Nevada, and in southern California. The lowest maximum temperature, 38, occurred at Duluth, Minn., and the maximum temperature was below 50 in north New England, and from Wisconsin westward over the east part of the Dakotas. At Block Island, R. I., the maximum temperature, 59, was 3 higher than the highest temperature previously reported for March, noted in 1886, and at Escanaba, Mich., the maximum

temperature, 57, was the same as that noted for 1879. The reports of United States Army post surgeons and voluntary observers show the following maximum temperatures in states and territories where temperature rising to or above 80 was reported: Fort Ringgold, Tex., 97; Volcano Springs, Cal., 96; Alva, Fla., 91; Gila Bend (2), Ariz., 90; Summit, Miss., 89; Wiggins, Ala., 85; Houma, La., 84; Hot Springs, Ark., and Louisville, Ga., 82; and Moab and Saint George, Utah, 80.

The lowest minimum temperature reported by a regular station of the Signal Service was —34, at Fort Assinniboine, Mont., and the temperature was below —30 generally over North Dakota and east Montana. Minimum temperature falling to or below 0 (zero) was reported north of a line traced from east Maine irregularly south of west to central Kansas, thence north of west to east Oregon, and thence northward over east Washington. At stations in the Dakotas, Montana, and north Nebraska, the minimum temperature was 2 to 8 lower than previously reported for March. The minimum temperature was also the lowest on record for March at Springfield, Ill., Olympia, Wash., and Portland, Oregon. The reports of United States Army post surgeons and voluntary observers show the following minimum temperatures in states and territories where minimum temperature falling to or below 0 (zero) was reported: Rhinelander, Wis., —44; Breckenridge, Colo., —41; Pokegama Falls, Minn., —40; Fort Niobrara, Nebr., —38; Fort Keogh, Mont., —37; Wahpeton, N. Dak., —36; Fort Bennett and Oelrichs, S. Dak., and Hayward, Wis., —28; Roscommon, Mich., —27; Henry's Lake, Idaho, —25; Alliance, Nebr., —24; Berlin Falls, N. H., —22; Fort Fetterman and Wheatland, Wyo., —20; Larrabee, Iowa, —19; Constableville, N. Y., and Jacksonville, Vt., —18; Corry and Dyberry, Pa., —14; Fairfield, Me., —13; Heath, Mass., and Monero, N. Mex., —12; Excelsior Springs, Mo., —11; Salineville, Ohio., —10; Pleasant Hill, W. Va., —9; Waterville, Wash., and Seneca, Kans., —7; New Hartford (1), Conn., and Aurora (1), Ill., —6; Delphi, Ind., —5; and Park City, Utah, —1.

### LIMITS OF FREEZING WEATHER.

The southern limit of freezing weather is shown on Chart IV by a line traced from the South Carolina coast, north of Charleston, westward to the Mississippi River, and thence southwest over southeast Texas. The western limit of freezing weather is shown by a line traced from south-central Arizona northwestward to extreme southwest Oregon.

### RANGES OF TEMPERATURE.

The greatest and least daily ranges of temperature are given in the table of Signal Service data. The greatest monthly ranges of temperature occurred on the northeast slope of the Rocky Mountains, where they exceed 90, whence they decreased eastward to less than 50 in parts of the Lake region, and in east and southeast New England, southeastward to less than 20 in extreme south Florida, and to less than 40 on the immediate Gulf coast, southward to less than 60 over the east part of the southern plateau, southwest to less than 40 on the south Pacific coast, and west to less than 30 at stations on the immediate middle and north Pacific coasts.

### FROST.

On the 14th frost injured fruits and vegetables at University, Miss., and on the 15th killing frost damaged tender vegetables and plants at Southport, N. C. On the 14th and 15th frost was reported generally in the east Gulf states, and on the 15th in north Florida. Frost was reported in the west Gulf states south of the 30th parallel on the 9th and 13th; in southeast Arizona on the 7th, 8th, and 9th, and in California as far south as Steeles, San Luis Obispo Co., on the 6th and 30th. Compared with the preceding month the southern limit of frost was about the same, except on the Pacific coast, where it was about 2° farther south in February.

## PRECIPITATION (expressed in inches and hundredths).

The distribution of precipitation over the United States and Canada for March, 1891, as determined from the reports of nearly 2,000 stations, is exhibited on Chart III. In the table of Signal Service data the total precipitation and the departure from the normal are given for each Signal Service station. The figures opposite the names of the geographical districts in the columns for precipitation and departure from the normal show, respectively, the averages for the several districts. The normal for any district may be found by adding the departure to the current mean when the precipitation is below the normal and subtracting when above.

The monthly precipitation exceeded 10.00 in extreme west North and South Carolina, the northern half of Georgia, and from central Mississippi eastward over northwestern Alabama and central Tennessee, at Fort Barrancas, Fla., and at stations in California on the Central Pacific Railroad crossing the summit of the Sierra Nevada Mountains. The monthly precipitation exceeded 8.00 over the greater part of the country east of the Mississippi and south of the Ohio rivers, in extreme northwest Washington, and on the extreme north California coast. At stations in extreme southeast California and west Arizona no precipitation was recorded, and less than 0.50 fell over a greater part of the southern plateau and southern California, in west Texas, and along the northern border of the country from the Red River of the North to northeast Washington. Less than 1.00 fell in areas in east-central Texas, in adjoining parts of Missouri, Kansas, Indian Territory, and Arkansas, and in areas in the Rocky Mountain and plateau regions.

The monthly precipitation was above the normal except over the extreme northeast part of the country, at Lake Erie stations, from the west Gulf coast west-northwest over California, and from Washington eastward over the northern part of the country to west Ontario. The greatest departure above the normal precipitation occurred from the lower Mississippi valley to the Atlantic coast between the 30th and 40th parallels, where it exceeded 4.00, in areas, and the excess was more than 2.00 at Portland, Me., and in an area extending from west Kansas to northwest Utah and southwest Wyoming. The greatest departure below the normal precipitation occurred in Nova Scotia, at Eastport, Me., Los Angeles, Cal., Olympia, Wash., Portland, Oregon, and New Orleans, La., where it was more than 2.00, and the deficiency was more than 1.00 along the middle and south Pacific coasts.

Considered by districts the average percentage of the normal in districts where the precipitation was in excess was about as follows: northeast slope of the Rocky Mountains, 270 per cent.; middle-eastern slope of the Rocky Mountains, 253 per cent.; middle plateau, 208 per cent.; Key West, Fla., 166 per cent.; extreme northwest, 171 per cent.; middle Atlantic states, 153 per cent.; Ohio Valley and Tennessee, 146 per cent.; southeast slope of the Rocky Mountains, 140 per cent.; upper lake region, 139 per cent.; south Atlantic states, 138 per cent.; Missouri Valley, 137 per cent.; east Gulf states, 126 per cent.; upper Mississippi valley, 116 per cent.; lower lake region, 107 per cent.; Rio Grande Valley, 102 per cent. In districts where the precipitation was deficient the percentage of the normal was about as follows: south Pacific coast, 27 per cent.; southern plateau, 43 per cent.; middle Pacific coast, 52 per cent.; northern plateau, 75 per cent.; west Gulf states and north Pacific coast, 90 per cent.; New England, 98 per cent.

At the following-named stations the precipitation for the current month was the heaviest ever reported for March: Baltimore, Md., 7.94, 3.85 above the normal, and 0.35 greater than previously reported for March, noted in 1881; Washington

City, 8.84, 4.64 above the normal, and 1.60 greater than in 1884; Cumberland, Md., 7.47, 4.59 above the normal, and 2.29 greater than in 1890; Birdsnest, Va., 9.10, 4.22 above the normal, and 0.35 greater than in 1884; Charlotte, N. C., 11.13, 6.37 above the normal, and 1.56 greater than in 1880; Statesburgh, S. C., 7.62, 3.81 above the normal, and 1.72 greater than in 1888; Nashville, Tenn., 10.31, 5.09 above the normal, and 0.93 greater than in 1882; Marquette, Mich., 4.45, 2.97 above the normal, and 0.61 greater than in 1881; Duluth, Minn., 3.13, 1.67 above the normal, and 0.08 greater than in 1882; Wellington, Kans., 3.86, 2.55 above the normal, and 0.89 greater than in 1889; North Platte, Nebr., 2.19, 1.57 above the normal, and 0.37 greater than in 1884; Denver, Colo., 3.10, 2.22 above the normal, and 0.74 greater than in 1886; Salt Lake City, Utah, 4.66, 2.74 above the normal, and 0.66 greater than in 1876; Helena, Mont., 1.37, 0.75 above the normal, and 0.05 greater than in 1888. The heaviest precipitation ever reported for March occurred in the middle Ohio valley in 1890, when the excess above the normal was 3.00 to 5.00; in the Sacramento Valley, on the south Pacific coast, and in Arizona in 1884, when the excess was 4.00 to 5.00 in the Sacramento Valley, 5.00 to 9.00 on the south Pacific coast, and 1.00 to 3.00 in Arizona; in the Red River of the North Valley and Minnesota in 1882, when the excess was 1.00 to 2.00; in the lower Rio Grande Valley in 1878, when the excess was 2.00 to 3.00; in the middle and lower Mississippi valleys and Kansas in 1876, when the excess was 3.00 to 6.00; in western New York in 1873, when the excess was 2.00 to 4.00; and on the South Carolina, Georgia, and north Florida coasts in 1872, when the excess was 4.00 to 6.00.

The least precipitation ever reported for March occurred from the south Atlantic coast over the east part of the east Gulf states and over the middle part of the middle and southern plateau regions in 1887, when the deficiency was 3.00 to 5.00 over the east part of the east Gulf states and 1.00 to 2.00 in the middle and southern plateau regions; generally on the Pacific coast and from the lower Missouri valley eastward over the middle Atlantic and south New England states in 1885, when the deficiency was 3.00 to 5.00 on the Pacific coast, and 2.00 to 4.00 from the Missouri Valley eastward; from the middle-eastern slope of the Rocky Mountains over the middle Missouri valley in 1882, when the deficiency was 0.50 to 0.75; and from the west Gulf states northeastward over central Tennessee in 1879, when the deficiency was 2.00 to 4.00.

In 1882, when the precipitation was the heaviest ever reported for March in the Red River of the North Valley and Minnesota it was the least ever reported for that month on the middle-eastern slope of the Rocky Mountains.

The precipitation from January to March, inclusive, averaged about as follows: in the south Atlantic and west Gulf states, at Key West, Fla., in the Rio Grande and upper Mississippi valleys, the Lake region, and on the middle and south Pacific coasts it was about normal. On the middle-eastern slope of the Rocky Mountains more than double the usual amount of precipitation was reported; in the middle Atlantic, east Gulf, and New England states, the Ohio Valley and Tennessee, the extreme northwest, the Missouri Valley, on the northeast and southeast slopes of the Rocky Mountains, and over the middle and southern plateau regions the precipitation was one-fourth to one-half greater than usual. Over the northern plateau and on the north Pacific coast about three-fourths of the usual amount of precipitation was reported.

### DEVIATIONS FROM AVERAGE PRECIPITATION.

The following table shows for certain stations, as reported by voluntary observers, (1) the average precipitation for March for a series of years; (2) the length of record during which the observations have been taken and from which the average has been computed; (3) the total precipitation for March, 1891; (4) the departure of the current month from the average; (5) and the extremes for March during the period of observation and the years of occurrence:

| State and station. | County. | (1) Average for the month of Mar. | (2) Length of record. | (3) Total for Mar., 1891. | (4) Departure from average. | (5) Extremes for Mar. | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Greatest. | | Least. | |
| | | | | | | Am't. | Year. | Am't. | Year. |
| *Arkansas.* | | *Inches* | *Years* | *Inches* | *Inches.* | *Inches.* | | *Inches* | |
| Lead Hill | Boone | 4.07 | 9 | 3.00 | −1.07 | 6.78 | 1890 | 2.84 | 1887 |
| *California.* | | | | | | | | | |
| Sacramento | Sacramento | 3.00 | 41 | 1.87 | −1.13 | 10.00 | 1850 | 0.09 | 1885 |
| *Connecticut.* | | | | | | | | | |
| Middletown | Middlesex | 4.67 | 29 | 5.96 | +1.29 | 9.49 | 1876 | 1.12 | 1874 |
| *Florida.* | | | | | | | | | |
| Merritt's Island | Brevard | 2.63 | 13 | 3.42 | +0.79 | 7.92 | 1878 | 0.76 | 1882 |
| *Georgia.* | | | | | | | | | |
| Forsyth | Monroe | 6.93 | 17 | 12.49 | +5.56 | 12.87 | 1875 | 1.37 | 1878 |
| *Illinois.* | | | | | | | | | |
| Peoria | Peoria | 2.55 | 36 | 2.68 | +0.13 | 5.82 | 1859 | 0.24 | 1885 |
| Riley | McHenry | 2.63 | 40 | 1.64 | −0.99 | 7.23 | 1876 | 0.29 | 1885 |
| *Indiana.* | | | | | | | | | |
| Logansport | Cass | 3.14 | 16 | 3.94 | +0.80 | 6.89 | 1861 | 0.95 | 1856 |
| Vevay | Switzerland | 3.93 | 26 | 7.71 | +3.78 | 7.84 | 1890 | 0.85 | 1889 |
| *Iowa.* | | | | | | | | | |
| Cresco | Howard | 1.78 | 18 | 1.68 | −0.10 | 4.33 | 1888 | 0.22 | 1889 |
| Monticello | Jones | 2.50 | 36 | 2.55 | +0.05 | 6.54 | 1877 | 0.07 | 1869 |
| Logan | Harrison | 2.12 | 23 | 2.33 | +0.21 | 4.50 | 1876 | 0.30 | 1885 |
| *Kansas.* | | | | | | | | | |
| Lawrence | Douglas | 2.23 | 23 | 3.04 | +0.81 | 5.47 | 1888 | 0.37 | 1879 |
| Wellington | Sumner | 1.31 | 12 | 3.86 | +2.55 | 3.86 | 1891 | 0.00 | 1879 |
| *Louisiana.* | | | | | | | | | |
| Grand Coteau | St. Landry | 5.32 | 8 | 0.80 | −4.52 | 10.20 | 1884 | 0.80 | 1891 |
| *Maine.* | | | | | | | | | |
| Orono | Penobscot | 4.31 | 21 | 5.20 | +0.89 | 8.20 | 1876 | 1.89 | 1883 |
| *Maryland.* | | | | | | | | | |
| Cumberland | Allegany | 2.88 | 19 | 7.47 | +4.59 | 7.47 | 1891 | 0.50 | 1872 |
| *Massachusetts.* | | | | | | | | | |
| Amherst | Hampshire | 3.45 | 55 | 3.14 | −0.31 | 7.14 | 1876 | 0.89 | 1858 |
| Newburyport | Essex | 4.23 | 11 | 4.51 | +0.28 | 6.94 | 1890 | 0.96 | 1885 |
| Somerset | Bristol | 4.98 | 18 | 5.53 | +0.35 | 9.61 | 1890 | 1.14 | 1885 |
| *Michigan.* | | | | | | | | | |
| Kalamazoo | Kalamazoo | 2.48 | 15 | 2.10 | −0.38 | 7.33 | 1877 | 0.42 | 1883 |
| Thornville | Lapeer | 2.39 | 14 | 2.40 | +0.01 | 4.67 | 1877 | 0.71 | 1889 |
| *Minnesota.* | | | | | | | | | |
| Minneapolis | Hennepin | 1.82 | 25 | 1.62 | −0.20 | 9.00 | 1868 | 0.32 | 1883 |
| *Montana.* | | | | | | | | | |
| Fort Shaw | Lewis&Clarke | 0.45 | 20 | 0.30 | −0.15 | 1.05 | 1883 | 0.04 | 1873 |
| *New Hampshire.* | | | | | | | | | |
| Hanover | Grafton | 2.35 | 51 | 2.32 | −0.03 | 5.25 | 1888 | 0.25 | 1866 |
| *New Jersey.* | | | | | | | | | |
| Moorestown | Burlington | 3.58 | 27 | 4.80 | +1.22 | 6.09 | 1890 | 1.08 | 1885 |
| South Orange | Essex | 3.86 | 19 | 4.81 | +0.95 | 8.20 | 1888 | 0.81 | 1885 |
| *New York.* | | | | | | | | | |
| Cooperstown | Otsego | 2.89 | 37 | 2.60 | −0.29 | 5.29 | 1871 | 0.55 | 1885 |
| Palermo | Oswego | 2.84 | 37 | 3.80 | +0.96 | 7.00 | 1859 | 0.68 | 1885 |
| *North Carolina.* | | | | | | | | | |
| Lenoir | Caldwell | 4.02 | 19 | 8.30 | +4.28 | 10.20 | 1875 | 0.50 | 1879 |
| *Ohio.* | | | | | | | | | |
| N. Lewisburgh | Champaign | 3.18 | 15 | 5.35 | +2.17 | 5.90 | 1888 | 0.75 | 1889 |
| Wauseon | Fulton | 2.81 | 19 | 4.45 | +1.64 | 6.52 | 1876 | 0.62 | 1885 |
| *Oregon.* | | | | | | | | | |
| Albany | Linn | 4.48 | 13 | 3.41 | −1.07 | 11.71 | 1866 | 0.81 | 1885 |
| Eola | Polk | 4.81 | 22 | 2.13 | −2.68 | 10.66 | 1879 | 0.55 | 1885 |
| *Pennsylvania.* | | | | | | | | | |
| Dyberry | Wayne | 3.02 | 24 | 4.19 | +1.17 | 5.00 | 1890 | 1.03 | 1885 |
| Grampian Hills | Clearfield | 3.96 | 20 | 3.97 | +0.01 | 6.89 | 1875 | 1.34 | 1885 |
| Wellsborough | Tioga | 5.16 | 11 | 2.72 | −2.44 | 10.08 | 1884 | 0.66 | 1887 |
| *South Carolina.* | | | | | | | | | |
| Statesburgh | Sumter | 3.81 | 10 | 7.62 | +3.81 | 7.62 | 1891 | 0.97 | 1887 |
| *Tennessee.* | | | | | | | | | |
| Austin | Wilson | 5.66 | 20 | 11.43 | +5.77 | 12.59 | 1875 | 1.93 | 1861 |
| *Texas.* | | | | | | | | | |
| New Ulm | Austin | 4.71 | 18 | 1.47 | −3.24 | 13.13 | 1883 | 1.27 | 1887 |
| *Vermont.* | | | | | | | | | |
| Strafford | Orange | 3.68 | 18 | 3.20 | −0.48 | 4.10 | 1876 | 1.55 | 1878 |
| *Virginia.* | | | | | | | | | |
| Birdsnest | Northampton | 4.88 | 22 | 9.10 | +4.22 | 9.10 | 1891 | 1.70 | 1873 |
| *Washington.* | | | | | | | | | |
| Fort Townsend | Jefferson | 1.87 | 15 | 0.55 | −1.32 | 4.32 | 1876 | 0.11 | 1884 |
| *Wisconsin.* | | | | | | | | | |
| Madison | Dane | 2.63 | 23 | 3.64 | +1.01 | 7.00 | 1869 | 0.30 | 1883 |

### EXCESSIVE PRECIPITATION.

Monthly precipitation to equal or exceed 10.00 was reported at 12 stations in Tenn.; at 11 stations in Ga.; at 8 stations in Miss.; at 6 stations in N. C. and S. C.; at 4 stations in Ala.; at 3 stations in Cal., and at 1 station in Fla. Among the heavier monthly rainfalls reported are, 15.50, at Kosciusko, Miss., 14.85, at Diamond, Ga., and 14.18, at Belmont, S. C.

In the last 21 years monthly precipitation to equal or exceed 10.00 in March has been reported for 12 years in Ga.; for 11 years in Ala.; for 9 years in Cal. and N. C.; for 8 years in Wash., Oregon, Miss., and Tenn.; for 6 years in Fla.; for 5 years in Ark. and La.; for 4 years in Mass., S. C., and Tex.; for 3 years in Conn., Ill., N. H., and N. Y.; for 2 years in Ind., N. J., Pa., Va., and Wis.; and for one year in Del., Kans., Ky., Md., Nebr., Ohio, R. I., and Utah. Precipitation to exceed 20.00 in March was reported in Oregon in 1873; in Ala. and Tex., in 1875; in Cal. and Wash., in 1879; and in Nebr., in 1882.

Precipitation to equal or exceed 2.50 in 24 hours was reported at 22 stations in Tenn., and on 4 dates, the 6th to 8th and 30th; at 13 stations in Miss., and on 7 dates, the 5th to 8th, 25th, 26th, and 30th; at 9 stations in Ala., and on 8 dates, the 5th to 8th, 11th, 12th, 25th, and 26th; at 9 stations in Ga., and on 9 dates, the 7th to 9th, 11th, 12th, 26th, 27th, 30th, and 31st; at 4 stations in Cal., on the 1st; at 3 stations in Fla., and on 4 dates, the 10th to 12th and 21st; at 3 stations in S. C., and on 3 dates, the 8th, 9th, and 27th; at 2 stations in La., and on 2 dates, the 7th and 8th; at 2 stations in N. C., and on 2 dates, the 7th and 8th; at 1 station in Del., on the 20th–21st; at 1 station in Idaho, on the 27th; at 1 station in Kans., on the 24–25th; at 1 station in Ky., on the 7–8th; and at 1 station in Wash., on the 20th–21st. Among the heavier rainfalls reported for this period are: 6.71, at Vaiden, Miss., 7–8th; 6.47, at Vicksburg, Miss., 7–8th; 6.10, at Winnsborough, La., 7–8th; 5.40, at Diamond, Ga., 7–8th; 5.23, at Sharp, Tenn., 7–8th; 5.00, at Hendersonville, N. C., 7–8th. At Kosciusko, Miss., 12.60 was reported 5–7th.

In the last 21 years precipitation to equal or exceed 2.50 in 24 hours in March has been reported for 16 years in Ala.; for 14 years in Ga.; for 12 years in La. and Tex.; for 11 years in Fla., N. C., and Tenn.; for 8 years in Miss.; for 7 years in Ark., Ill., and Ind.; for 5 years in Conn., Mass., N. Y., and S. C.; for 4 years in Cal. and Wash.; for 3 years in Iowa, Kans., Ky., Md., Ohio, Oregon, and Va.; for 2 years in N. J., Pa., and Vt.; and for one year in Ariz., Colo., the Dakotas, D. C., Mo., R. I., and Utah. Among the heavier 24-hour rainfalls reported during this period are: 12.65 at Okaloosa, La., 9th, 1878; 7.36 at Atlanta, Ga., 29th, 1886; 8.00 at South Fork, Ky., 22d, 1890.

Precipitation to equal or exceed 1.00 in 1 hour was reported at 1 station in Tenn., on the 6th; and at 1 station in Miss., on the 8th. Remarkably heavy rainfall in 1 hour was not reported for March, 1891, and excessive rainfall for 5 and 10 minute periods is given in the table of "Maximum rainfall in one hour or less."

In the last 21 years precipitation to equal or exceed 1.00 in one hour in March has been reported for 7 years in Tex.; for 6 years in Tenn.; for 5 years in Fla.; for 3 years in N. C.; for 2 years in Ga. and La.; and for one year in Ala., Ark., Miss., N. Y., Pa., and Va. Among the heavier rainfalls reported for this period are: 0.30 in 5 minutes, at Saint Louis, Mo., 27th, 1890; 0.25 in 5 minutes, at Jupiter, Fla., 23d, 1890; 0.60 in 10 minutes, at Saint Louis, Mo., 27th, 1890; 1.08 in 15 minutes, at Knoxville, Tenn., 12th, 1878; 2.00 in 15 minutes (estimated), at Greeneville, Tenn., 27th, 1885; 1.75 in 20 minutes, at Howe, Tex., 21st, 1890; 4.10 in 30 minutes, at Biscayne, Fla., 28th, 1874; and 4.00 in 1 hour, at Terrell, Tex., 19th, 1876.

*Table of excessive precipitation, March, 1891.*

| State and station. | Monthly rainfall 10 inches, or more. | Rainfall 2.50 inches, or more, in 24 hours. | | Rainfall of 1 inch or more, in one hour. | | |
|---|---|---|---|---|---|---|
| | | Amt. | Day. | Amt. | Time. | Day. |
| *Alabama.* | *Inches.* | *Inches.* | | *Inches* | *h. m.* | |
| Cordova | 10.46 | 3.31 | 6 | | | |
| Do | | 3.38 | 8 | | | |
| Florence | 11.80 | 3.90 | 7,8 | | | |
| Jasper | 11.62 | | | | | |
| Livingston (1) | | 3.86 | 7,8 | | | |
| Montgomery | | 2.62 | 25,26 | | | |
| Mount Vernon Barracks | | 3.33 | 25,26 | | | |
| Selma (1) | | 3.00 | 7,8 | | | |
| Talladega | | 2.73 | 8 | | | |
| Tuscaloosa | | 2.78 | 5,6 | | | |
| Tuscumbia (1) | 10.03 | | | | | |
| Wiggins | | 3.26 | 8 | | | |
| Do | | 3.05 | 11,12 | | | |
| *California.* | | | | | | |
| Georgetown | 10.00 | 3.82 | 1 | | | |
| Grass Valley | | 2.59 | 1 | | | |
| Iowa Hill | | 3.02 | 1 | | | |
| Placerville (2) | | 3.15 | 1 | | | |
| Towles | 10.52 | | | | | |
| *Delaware.* | | | | | | |
| Dover | | 3.29 | 20,21 | | | |

*Table of excessive precipitation*—Continued.

| State and station. | Monthly rainfall 10 inches, or more. | Rainfall 2.50 inches, or more, in 24 hours. | | Rainfall of 1 inch, or more, in one hour. | | |
|---|---|---|---|---|---|---|
| | | Amt. | Day. | Amt. | Time. | Day. |
| *Florida.* | *Inches.* | *Inches.* | | *Inches* | *h. m.* | |
| Eustis | | 3.73 | 21 | | | |
| Fort Barrancas | 10.19 | 2.75 | 10,11 | | | |
| Pensacola | | 2.64 | 11,12 | | | |
| *Georgia.* | | | | | | |
| Athens (1) | 11.53 | 3.85 | 7,8 | | | |
| Do | | 2.95 | 26 | | | |
| Athens (2) | 12.28 | | | | | |
| Atlanta | 10.16 | | | | | |
| Blakely | | 4.80 | 11,12 | | | |
| Diamond | 14.85 | 5.40 | 7,8 | | | |
| Do | | 4.00 | 30,31 | | | |
| Elberton | | 2.87 | 27 | | | |
| Forsyth | 12.49 | 4.16 | 8 | | | |
| Do | | 2.98 | 11,12 | | | |
| Fort McPherson | 10.16 | | | | | |
| Gillsville | 10.55 | | | | | |
| Marietta | 10.32 | 3.93 | 8,9 | | | |
| Milledgeville | 12.68 | 4.37 | 8 | | | |
| Do | | 3.38 | 11 | | | |
| Do | | 2.60 | 26 | | | |
| Monticello | 13.64 | 3.20 | 5,6 | | | |
| Do | | 4.11 | 8 | | | |
| Do | | 2.73 | 11,12 | | | |
| Point Peter | 11.30 | 3.00 | 8,9 | | | |
| Do | | 2.80 | 26,27 | | | |
| *Kansas.* | | | | | | |
| Oberlin | | 3.75 | 24,25 | | | |
| *Kentucky.* | | | | | | |
| Burnside | | 2.55 | 7,8 | | | |
| *Louisiana.* | | | | | | |
| Liberty Hill | | 2.87 | 7 | | | |
| Winnsborough | | 6.10 | 7,8 | | | |
| *Mississippi.* | | | | | | |
| Agricultural College | | 3.53 | 5 | | | |
| Booneville | 11.62 | 3.00 | 7 | | | |
| Do | | 2.80 | 30 | | | |
| Canton | | 5.65 | 7,8 | | | |
| Columbus (1) | 12.57 | 5.48 | 5,6 | | | |
| Holly Springs (1) | 10.44 | 2.65 | 5 | | | |
| Do | | 2.65 | 30 | | | |
| Kosciusko | 15.50 | 12.60 | 5,6,7 | | | |
| Louisville | | 5.33 | 5,6,7 | | | |
| Meridian | 10.59 | 4.80 | 7,8 | 2.10 | 1 00 | 8 |
| Do | | 3.30 | 25,26 | | | |
| Pontotoc | | 2.57 | 7 | | | |
| University | 11.10 | 3.43 | 5,6 | | | |
| Vaiden | 11.94 | 6.71 | 7,8 | | | |
| Vicksburg | 10.51 | 6.47 | 7,8 | | | |
| Yazoo City | | 4.00 | 7,8 | | | |
| *North Carolina.* | | | | | | |
| Charlotte | 11.13 | | | | | |
| Hendersonville | 11.67 | 5.00 | 7,8 | | | |
| Mount Holly | 10.41 | | | | | |
| Mount Pleasant | 10.13 | | | | | |
| Murphy | 10.41 | 2.65 | 8 | | | |
| Soapstone Mount | 10.50 | | | | | |
| *South Carolina.* | | | | | | |
| Belmont | 14.18 | 3.90 | 8 | | | |
| Evergreen | 11.60 | 3.08 | 9 | | | |
| Do | | 2.65 | 27 | | | |
| Greenville | 11.60 | 3.78 | 8,9 | | | |
| Simpsonville | 10.91 | | | | | |
| Walhalla | 10.60 | | | | | |
| Yorkville | 12.47 | | | | | |
| *Tennessee.* | | | | | | |
| Ashwood | 10.39 | 3.35 | 7 | | | |
| Austin | 11.43 | 3.19 | 8 | | | |
| Charleston | | 2.60 | 7,8 | | | |
| Chattanooga | | 3.09 | 7,8 | | | |
| Clarksville | | 2.60 | 7 | | | |
| Columbia | 10.06 | 2.50 | 7,8 | | | |
| Dunlap | | 3.00 | 8 | | | |
| Fayetteville | | 2.57 | 8 | | | |
| Florence Station | | 3.84 | 7 | | | |
| Franklin | 10.03 | 3.73 | 7 | 1.00 | 1 00 | 6 |
| Hohenwald | 12.42 | 4.38 | 8 | | | |
| Kingston (1) | 10.42 | 3.30 | 7,8 | | | |
| Kingston Springs | 10.40 | 2.50 | 7 | | | |
| Lewisburgh | | 3.65 | 8 | | | |
| Lynnville | | 3.72 | 8 | | | |
| Memphis | | 2.85 | 6,7 | | | |
| Nashville | 10.31 | 4.35 | 7,8 | | | |
| Nunnelly | 10.80 | 4.00 | 7,8 | | | |
| Parksville | | 2.82 | 8 | | | |
| Rockwood | 10.54 | 2.90 | 7,8 | | | |
| Rugby | | 2.50 | 8 | | | |
| Sharp | 11.75 | 5.23 | 7,8 | | | |
| Do | | 2.95 | 30 | | | |
| Waynesborough | 10.34 | | | | | |
| *Washington.* | | | | | | |
| Neah Bay | | 2.55 | 20,21 | | | |

*Received too late to be used in general discussion for March, 1891.*

| State and station. | Monthly rainfall 10 inches, or more. | Rainfall 2.50 inches, or more, in 24 hours. | | Rainfall of 1 inch, or more, in one hour. | | |
|---|---|---|---|---|---|---|
| | | Amt. | Day. | Amt. | Time. | Day. |
| *Mississippi.* | *Inches.* | *Inches.* | | *Inches* | *h. m.* | |
| Edwards | ..... | 2.58 | 7 | ..... | ..... | ..... |
| Enterprise | ..... | 3.46 | 25 | ..... | ..... | ..... |
| Hattiesburgh | ..... | 2.75 | 25 | ..... | ..... | ..... |

*Received too late for publication in February, 1891.*

| | | | | | | |
|---|---|---|---|---|---|---|
| *California.* | | | | | | |
| Beaumont | ..... | 2.70 | 23 | ..... | ..... | ..... |
| Campo (near)* | 11.25 | 5.50 | 16, 17, 18 | ..... | ..... | ..... |
| Do | ..... | 3.00 | 22 | ..... | ..... | ..... |
| Colegrove | 10.14 | 3.17 | 15-16 | ..... | ..... | ..... |
| Do | ..... | 4.06 | 21-22 | ..... | ..... | ..... |
| Corning | 10.80 | ..... | ..... | ..... | ..... | ..... |
| Crescent City L. H | 17.23 | ..... | ..... | ..... | ..... | ..... |
| Downey | ..... | 3.91 | 16 | ..... | ..... | ..... |
| Florence | ..... | 3.19 | 16 | ..... | ..... | ..... |
| Glen Ellen | 15.51 | ..... | ..... | ..... | ..... | ..... |
| Newhall | ..... | 4.84 | 22 | ..... | ..... | ..... |
| Norwalk | ..... | 2.69 | 16 | ..... | ..... | ..... |
| Ontario | ..... | 3.20 | 23 | ..... | ..... | ..... |
| Point Año Nuevo L. H | 11.45 | ..... | ..... | ..... | ..... | ..... |
| Point Montara L. H | 12.53 | ..... | ..... | ..... | ..... | ..... |
| Pomono | ..... | 3.85 | 23 | ..... | ..... | ..... |
| Pcente | ..... | 3.25 | 23 | ..... | ..... | ..... |
| Ravenna | ..... | 4.50 | 23 | ..... | ..... | ..... |
| San Gabriel | ..... | 5.70 | 22 | ..... | ..... | ..... |
| Santa Ana | ..... | 2.58 | 17 | ..... | ..... | ..... |
| Santa Barbara (2) | ..... | 2.70 | 23 | ..... | ..... | ..... |
| Santa Margarita | ..... | 3.04 | 23 | ..... | ..... | ..... |
| Santa Monica | ..... | 4.68 | 16 | ..... | ..... | ..... |
| Do | ..... | 2.66 | 22 | ..... | ..... | ..... |
| Santa Paula | ..... | 3.00 | 23 | ..... | ..... | ..... |
| Seven Palms | ..... | 4.03 | 23 | ..... | ..... | ..... |
| Spadra | ..... | 3.20 | 23 | ..... | ..... | ..... |
| Templeton | ..... | 2.62 | 23 | ..... | ..... | ..... |
| Tropico | ..... | 3.33 | 23 | ..... | ..... | ..... |
| *Georgia.* | | | | | | |
| Diamond | 18.27 | 3.60 | 12-13 | ..... | ..... | ..... |

*1562 Obs., 1891.

## MAXIMUM RAINFALL IN ONE HOUR OR LESS.

The following table is a record of the heaviest rainfall during March, 1891, for periods of five and ten minutes and one hour, as reported by regular stations of the Signal Service furnished with self-registering gauges:

| Station. | Maximum fall in— | | | | | |
|---|---|---|---|---|---|---|
| | 5 min. | Date. | 10 min. | Date. | 1 hour. | Date. |
| | *Inch.* | | *Inch.* | | *Inch.* | |
| Bismarck, N. Dak‡ | ..... | ..... | ..... | ..... | ..... | ..... |
| Boston, Mass | 0.06 | 31 | 0.11 | 31 | 0.40 | 21 |
| Buffalo, N. Y | 0.01 | 31 | 0.02 | 31 | 0.10 | 31 |
| Cincinnati, Ohio † | ..... | ..... | ..... | ..... | ..... | ..... |
| Chicago, Ill ‡ | ..... | ..... | ..... | ..... | ..... | ..... |
| Cleveland, Ohio | 0.02 | 9 | 0.04 | 9 | 0.11 | 9 |
| Denver, Colo ‡ | ..... | ..... | ..... | ..... | ..... | ..... |
| Detroit, Mich ‡ | ..... | ..... | ..... | ..... | ..... | ..... |
| Dodge City, Kans | * | ..... | * | ..... | 0.05 | 23 |
| Duluth, Minn ‡ | ..... | ..... | ..... | ..... | ..... | ..... |
| Eastport, Me | 0.05 | 10 | 0.08 | 10 | 0.30 | 10 |
| Galveston, Tex † | ..... | ..... | ..... | ..... | ..... | ..... |
| Jupiter, Fla | 0.20 | 9 | 0.30 | 9 | 0.35 | 9 |
| Kansas City, Mo | 0.20 | 29 | 0.25 | 29 | 0.45 | 29 |
| Key West, Fla | 0.35 | 27 | 0.42 | 27 | 0.71 | 27 |
| Marquette, Mich ‡ | ..... | ..... | ..... | ..... | ..... | ..... |
| Memphis, Tenn | 0.20 | 7 | 0.30 | 7 | 0.75 | 7 |
| New York City | 0.14 | 9 | 0.18 | 9 | 0.25 | 9 |
| New Orleans, La | 0.43 | 25 | 0.25 | 25 | 0.51 | 25 |
| Norfolk, Va | 0.07 | 22 | 0.12 | 22 | 0.76 | 3 |
| Philadelphia, Pa | 0.10 | 9 | 0.17 | 9 | 0.30 | 9, 20 |
| Philadelphia Water Works | 0.05 | 23 | 0.10 | 23 | 0.30 | 20 |
| Portland, Oregon | 0.03 | 25 | 0.05 | 25 | 0.15 | 25 |
| Saint Louis, Mo | 0.10 | 25 | 0.11 | 25 | 0.18 | 19 |
| Saint Paul, Minn ‡ | ..... | ..... | ..... | ..... | ..... | ..... |
| San Diego, Cal‡ | ..... | ..... | ..... | ..... | ..... | ..... |
| San Francisco, Cal † | ..... | ..... | ..... | ..... | ..... | ..... |
| Savannah, Ga | 0.15 | 21 | 0.15 | 21 | 0.25 | 17, 27 |
| Washington City | 0.03 | 22 | 0.05 | 22 | 0.25 | 31 |
| Wilmington, N. C | 0.20 | 27 | 0.25 | 8 | 0.50 | 31 |

* Not sufficient to register. † Rain-gauge not working. ‡ Less than .05 in 1 hour.
‡ No record on account of snow.

## SNOW (in inches and tenths).

Chart V shows the depth of snowfall reported for the month. The heaviest monthly snowfall was 64.0, at Cumbres, Colo.; 54.5 was reported at Blue Knob, Pa.; 51.0 at Summit, Cal.; 46.5 at Alton, Kans., and 45.4 at Marquette, Mich. The monthly snowfall exceeded 20.0 in central New York, at elevated stations in Pa., and thence southward to north-central Virginia, from the north part of the upper lake region southward over east Iowa, in north Kansas and south Nebraska, at elevated stations in Colorado, south Wyoming, and northeast Utah, and at stations on the middle-eastern and northeast slopes of the Rocky Mountains. The monthly snowfall exceeded 10.0 in the interior of New England and the middle Atlantic states, and north of a line traced from west-central Pennsylvania irregularly south of west to north New Mexico, and thence west of north to north Idaho (except in northeast Montana and west North Dakota), in east-central and northeast Nevada, and in the mountains of northeast California. Compared with the preceding month snow was reported about 3° farther south in Texas, while the western limit remained about the same.

The following is a record of the heaviest snowfall reported for March in the several states and territories from 1882 to 1890, inclusive, with the year of occurrence: in 1890, Ala., trace, at Valley Head; Ariz., 19.0, at Prescott; Ark., 5.3, at Winslow; Colo., 64.5, at Breckenridge; Conn.; 30.0, at Falls Village; Ga., 2.7, at Diamond; Ill., 23.0, at Lake Forest; Ind., 21.0, at Evansville; Me., 45.0, at Cornish; Mass., 40.0, at Groton; Mich., 52.5, at Bear Lake; Mo., 21.0, at Saint Louis; Mont., 18.1, at Fort Maginnis; Nebr., 19.2, at Valentine; Nev., 37.0, at Ruby Hill; N. H., 42.0, at Nashua; N. J., 25.5, at Oceanic; N. Mex., 14.0, at Chama; Ohio, 21.9, at Jefferson; Oregon, 23.0, at Siskiyou; Pa., 49.0, at Blue Knob; R. I., 26.0, at Woonsocket; Wash., 6.0, at Waterville; Wyo., 28.8, at Camp Sheridan. In 1889, Indian Territory, 0.4, at Fort Sill; Tex., 3.9, at Fort Elliott. In 1887, Ky., 15.6, at Harper's Ferry; Md., 15.0, at Fallston; Vt., 53.0, at Strafford; W. Va., 25.5, at Middlebrook. In 1886, Iowa, 28.0, at Clinton; Kans., 15.4, at Concordia; Wis., 27.1, at Madison. In 1885, Dak., 32.5, at Deadwood; S. C., 11.0, at Pacolet; Tenn., 12.0, at Milan. In 1884, Del., 12.0, at Saint George's; N. Y., 67.2, at Dannemora; Utah, 32.0, at Salt Lake City. In 1883, District of Columbia, 8.0, at Washington City; N. C., 13.0, at Ore Knob; Va., 15.5, at Wytheville. In 1882, Cal., 251, at Cisco; Idaho, 34.5, at Eagle Rock; Minn., 27.2, at Duluth.

The first snow of the season was reported at Palestine, Tex., 1st, at Willcox, Ariz., 4th, and Augusta, Ga., 7th.

On the 2d a heavy snow storm prevailed over south Montana and South Dakota. At Grand Haven, Mich., light snow was reported from a cloudless sky from 9.30 to 11.30 a. m. On the 4th a heavy snow storm blockaded railroad trains in South Dakota and southwest Minnesota. At Alpena, Mich., the heaviest storm of the season occurred, the snow drifting 4 to 6 feet deep. At New London, Conn., a heavy snow storm, with high wind, delayed Sound boats 12 to 15 hours. At Boston, Mass., the snow storm continued from the morning of the 3d to the early morning of the 5th, during which time 13.8 inches fell, and street and railroad traffic was interrupted. At Manchester, N. H., snow began the morning of the 3d and continued through the 4th, causing considerable interruption to traffic in the surrounding country. On the 5th, at Minneapolis, Minn., light snow was reported from a cloudless sky from 8.30 to 10.30 p. m. On the 6th the heaviest snow of the season fell at Milwaukee, Wis., 6.0 fell from 7.40 a. m. to 6.30 p. m., and the greater part of this amount fell in 6 hours. On the 7th a heavy fall of snow occurred from west Iowa to east Colorado, and by the 8th the storm had extended eastward to Illinois. On the 8th over 8.0 fell at Cedar Rapids and Dubuque, Iowa. From the 9th to 12th the Denver and Rio Grande Railroad was blockaded by snow between Tres Piedras, N. Mex., and Antonito, Colo., and a heavy snow storm was reported in San Juan Co., N. Mex. On the 10th railroad travel in North Dakota was impeded by heavy snow. A snow and sleet storm at Memphis, Tenn., on the 12–13th seriously interfered with electric railroad travel and electric lights. On the 13th one of the heaviest snow storms of the season

occurred at Port Huron, Mich.; snowfall about 6.5. On the 13–14th a heavy snow storm prevailed at Cleveland, Ohio. On the 19th snow-flakes the size of a silver dollar fell from 1 to 2 p. m. at Columbia, Mo. On the 21st 14.0 was reported at Meshoppen, Pa.; sheds were broken down and roofs caved in under the weight of snow. From the 23d to 25th a heavy snow storm prevailed over Kansas; 10.0 to 20.0 fell, and the snow drifted badly in places, blockading railroads and causing loss of live stock. On the 27th heavy snow fell in York Co., Pa., the estimated depth being 14.0. On the 27th and 28th a heavy snow storm prevailed over south Pennsylvania, Maryland, District of Columbia, and north Virginia, the depth varying from 10.0 to 20.0. This storm was reported the heaviest of the season, and in Frederick Co., Va., it was reported the heaviest snow storm in many years. On the 29th and 30th a heavy snow storm prevailed in South Dakota and Nebraska. This snow storm was reported the heaviest in years. At North Platte, Nebr., 12.0 fell on the 29th.

Snowfall of 10.0, or more, was reported as follows, and in states and territories where the maximum depth was less than that amount, the station reporting the greatest is given: *Alabama.*—Valley Head, trace. *Arizona.*—Holbrook, 7. *Arkansas.*—Mount Nebo, 7.5. *California.*—Summit, 51; Truckee, 28; Cisco, 25; Emigrant Gap, 20; Boca, 18. *Colorado.*—Cumbres, 64; Smoky Hill Mine, 54; Leadville, 46.5; Lamar, 46.1; Stunner, 44.2; Breckenridge, 41.5; Denver, 41.4; Climax, 39.5; Stamford, 38; Dillon, 35.2; Red Cliff, 35.1; Saint Cloud, 32; Box Elder and Elkhorn, 30.5; Rifle Falls, 30; Burlington and Magnolia, 29; Husted, 26.5; Fort Logan, 26; Idaho Springs, 25.8; Las Animas, 24; T. S. Ranch, 21.7; Cañon City, Rico, and Watervale, 21; Meeker, 20.5; Greenhorn and Yuma, 20.2; Akron, 20; San Luis, 19.8; Le Roy and Wray, 19; Abbott, 18; Apishapa, 17.5; Alma and Amherst, 17; Livermore, 16.6; Julesburg, 16.5; Sheridan Lake, 16; Minneapolis, 15; Alford, 14.9; Byers, 14.8; Villa Grove, 14.2; Bennet, 14; Fort Lewis, 13.8; Longmont, 13.2; Monte Vista (1), Rocky Ford, and Vilas, 13; Castle Rock, 12.9; Crook, 12.8; Westcliffe, 12.5; Beaver Creek and Springfield, 12.2; Brandon, 12; Pueblo, 11.9; Brush, 10.7; Agate and Lay, 10.5; Kit Carson, 10.1; Cheyenne Falls and Deer Trail, 10. *Connecticut.*—North Grosvenor Dale, 12. *Delaware.*—Dover, 4.5. *District of Columbia.*—Washington City, 17. *Idaho.*—Henry's Lake, 14; Mullan, 11. *Illinois.*—Rock Island Arsenal, 20.1; Warsaw and Winnebago, 17; Lanark and Rockford, 15; East Peoria, 12.4; Belvidere, 11.5; Lacon, 10.5. *Indiana.*—Angola, 15.8; Rushville, 11.5; Princeton, 11; Logansport, 10.5; Connersville and Farmland, 10. *Indian Territory.*—Wynne Wood, 3.7. *Iowa.*—Fairfield, 32.5; Carroll and Hampton, 29; Washington, 26.5; Indianola, 25.5; Dubuque and Belle Plaine, 25; Muscatine, 23.8; Webster City, 23.2; Cedar Rapids, 22.5; Vinton and West Bend, 22; Dallas Centre and Tipton, 21; Monticello, 20.5; Greenfield, 19.9; Independence, 19.5; Ames and Iowa City, 19; Fayette and Marshalltown, 18.8; Amana and Clinton, 18; Des Moines, 17.5; Oskaloosa, 17.3; Clarinda, 17; Cedar Falls, 16.3; Eagle Grove, 16; Hopeville and Manson, 15.5; Stilson, 15; Williams, 14.1; Logan, 14; Charles City, 13.6; Humboldt, 13.2; Keokuk, 13.1; Fort Madison, 13; Cresco, 12; Larrabee, 11.9; Glenwood, 10.8; Alta (1 and 2), 10.5; Davenport, 10. *Kansas.*—Alton, 46.5; Collyer and McAllaster, 33.5; Downs, 26.5; Wakefield, 25.8; Concordia, 25; Springvale, 22; Buffalo Park and Seneca, 21.5; Abilene, 20.6; Fremont, 20.2; Dodge City, 20; Grainfield, 19.2; Wa Keeny, 19.1; Sharon Springs and Wallace (2), 19; Allison, 18.6; Macksville, 18.5; Monument, 18.4; Cawker City and La Crosse, 18; Ellis, 17.9; Shields, 17.6; Gove City, Hoxie, Lakin, and Salina, 17; Pleasant Dale, 16.5; Coldwater, Havensville, and Manhattan (3), 16; Grinnell, 15.5; Leoti and Spearville, 15; Leavenworth, 14.9; Burr Oak, 14.5; Manhattan (1) and Quinter, 14; Ogallah, 12.8; Eureka Ranch and Scott City, 12.5; Minneapolis, 12.2; Manhattan (2), Mankato, and Weskan, 12; Cunningham, 11.3; Globe, 11.2; Hutchinson, 11.1; Horton and Tribune, 11; Kansas City, 10.7; Page City, 10. *Kentucky.*—Pellville, 7.8. *Maine.*—Calais, 21; Farmington, 15.2; Fairfield, 15; Orono, 12; Eastport, 11.3; Lewiston, 11; Kent's Hill, 10. *Maryland.*—Mount Saint Mary's, 35; Cumberland (1), 33; Woodstock, 25.9; Gaithersburgh, 24; Cumberland (2), 21; Baltimore, 20.5; McDonogh, 18.9? *Massachusetts.*—Mystic Lake, 23; Wakefield, 22; Concord and Salem (2), 21; Andover, Fitchburgh (1), Groton (1), and Newburyport (1), 18; Westborough, 17.5; Kendall Green, 17; Boston, 16.2; Lawrence and Winchester, 16; Blue Hill (summit), 15.3; North Billerica, 15; Chestnut Hill and Milton, 14.5; Fitchburgh (2), Leominster, and Mansfield, 14; Royalston, 13.4; Robert's Dam and Randolph, 13; Fort Warren, 12.2; Amherst Experimental Station (1), Gilbertville, Ludlow (1 and 2), South Hingham, and Springfield Armory, 12; Dudley, 10. *Michigan.*—Marquette, 45.4; Roscommon, 35.7; Grayling, 34.5; Northport, 32.5; Atlantic, 32; Caldwell, 30; Ivan, 26.5; Cheboygan, 25.5; Alpena, 24.6; Bear Lake, 24.5; Crystal Falls, 22.7; Charlevoix and Saint Ignace, 22.5; Calumet, 22.1; Fort Mackinac, 21.6; Rockland, 21.5; Harbor Springs, 21; Manistee, 20.1; Noble, 18.5; White Pigeon, 17.3; Buchanan and Colon, 17; Alma and Bellaire, 16.7; Pontiac, 16.5; Fort Brady, 15.6; Fitchburgh, 15.2; Gaylord, 15; North Aurelius and West Branch, 14.5; Hudson, 14.4; Ball Mountain, Berrien Springs (2), Grape, and Thornville, 14; Lansing, 13.9; North Marshall, 13.7; Adrian and Madison, 13.6; Birch Run, 13.4; Washington, 13.2; Port Huron and Chelsea, 13.1; Cassopolis, Hillman, Howell, and Rawsonville, 13; Stanton, 12.6; May, 12.5; Jeddo, 12.2; Williamstown, 12; Vandalia, 11.9; Berlin, Eden, and Highland Station, 11.5; Marshall, Mottville, and Olivet, 11.2; Evart, Fairview, and Otsego, 11; Bell Branch, 10.7; Sault de Ste. Marie, 10.1; Bronson, Hayes, and Ypsilanti, 10. *Minnesota.*—Duluth, 31; Grand Meadow, 17; Saint Charles, 16.5; Sheldon, 16; Red Wing, 15.6; Faribault, 14.7; Moorhead, 14.1; Farmington and Mankato, 13.5; Pokegama Falls, 13.3; Minneapolis, 12.5; Northfield, 12.2; Kinbrae, 12; Crookston, 11.5; Rolling Green, 11; Alma City, 10.3. *Mississippi.*—University, Pontotoc, and Water Valley, trace. *Missouri.*—Oregon (1), 22.1; Pickering, 18; Excelsior Springs, 14.2; Langdon, 14.1; Darksville and Glasgow, 12; Kansas City and Liberty, 11.8; Carrollton, 11.6; Platte River, 10.8?; Grand Pass and Princeton, 10. *Montana.*—Helena, 22; Fort Missoula and Virginia City, 19; Martinsdale, 15.2; Choteau, 10.

*Nebraska.*—Grant, 31.5; Tecumseh, 30.2; Hay Springs and Weeping Water, 25.5; Valentine, 24.8; North Platte, 23.8; Fairbury, 23; Auburn (1) and Imperial 20; Fort Robinson, 19.5; O'Neill, 19; Lincoln, 18.8; Ansley, 18.7; Crete, 18.4; Ravenna, 17.8; Hebron, 17.5; Lexington, 17; Ashland, 16; Culbertson and Fort Niobrara, 15; North Loup, 14.5?; Alliance, Bassett, Minden, Omaha, and Sargent, 14; David City and Ericson, 12; Gering, 12.2; Syracuse, 12; Fort Sidney, 11.7; Fairfield and Genoa, 11; Harvard, 10.8. *Nevada.*—Eureka, 18.7: Crane's Ranch, 18; Austin, 17.8; Virginia City, 15.5; Palmetto, 14.3; Palisade, Carlin, and Elko, 13; Lewer's Ranch, 11.4; Fenelon, 11; Toano, 10. *New Hampshire,*—North Conway, 22; Berlin Mills, 21; Newton, 18; West Milan, 17; Nashua, 15; Antrim and East Canterbury, 13; Concord, Hanover (1), and Plymouth, 12; Littleton, Stratford, and Walpole, 10. *New Jersey.*—Bridgeton, 10. *New Mexico.*—Fort Wingate, 17; Cuba, 15.5; Monero, 15.3; Gallinas Spring, 15; Albert, 10. *New York.*—Le Roy, 36; Constableville, 32; Turin, 26.6; Lowville, 22; Utica, 20.5; Apulia, 20; Malone, 19.5; Sherman, 17; Number Four, 15.8; Brookfield, 15.5; Canton, 14.6; Humphrey, 14.5; Plattsburgh Barracks, 14.3; Newark Valley and Potsdam, 14; Oswego and Baldwinsville, 13.5; Ogdensburgh (1), 12.5; Lyon Mountain (2) and Rochester, 12.2; Alabama, Middleburgh, and Port Jervis, 12; South Canisteo, 11.8; Keene Valley, 11.2; Rondout 11; Binghampton, 10.5; Hess Road Station, 10.3; Adams Centre, Cooperstown, and Galway, 10. *North Carolina.*—Murphy, 3. *North Dakota.*—Steele, 15.2; Bismarck, 11.4; Napoleon, 11.1; Fort Pembina, 10.9; Wahpeton, 10. *Ohio.*—Wapakoneta, 20.6; Montpelier,

20.2; Findlay, 18.2; Wauseon, 17.4; Caledonia, 16.8; Celina, Sidney, and Orangeville, 16.5; Napoleon, 16.2; North Lewisburgh, 14; Kenton, 13.5; Wheeler, 13.2; West Milton, 12.9; Leipsic, 12.8; Garrettsville, 12.5; Bellevue and Bement, 11.5; Greenville, 11.3; Tiffin, 10.8; Hiram, 10.6; Columbus, Toledo, and Upper Sandusky, 10. *Oklahoma Territory.*—Buffalo, 18. *Oregon.*—Joseph, 20.5; Lone Rock, 14.5; Heppner, 14; Happy Valley, 11.5. *Pennsylvania.*—Blue Knob, 54.5; Charlesville, 39; Carlisle, 33.2; Grampian Hills, 31; Lewisburgh, 27.6; Coatesville, 25.9; Selin's Grove, 25.2; York and McConnellsburgh, 24; Somerset, 23; Harrisburgh and Smethport, 22; Lock Haven, 21.5; Lancaster, 21; Meshoppen, 20.5; Nisbet, 20; Kennett Square, 19.5; Aqueduct and West Chester, 18.5; Hollidaysburgh, 18.2; Greenville, 18; Kilmer, 17.2; Johnstown, 17; Emporium and Pleasant Mount, 16.5; Lebanon, 15.7; State College, 15.1; Rimersburgh and South Eaton, 15; Salem Corners, 14.8; Eagle's Mere, 14.2; Erie, 14; Westtown, 13.5; Wysox, 13; Le Roy, 12.2; Blooming Grove, 12; Dyberry and Girardville, 11; Honesdale, 10.5; Troy and Wilkes Barre, 10.

*Rhode Island.*—Lonsdale and Pawtucket, 9.0. *South Dakota.*—Oelrichs, 40; Cross, 20.2; Webster, 18.1; Elkton, 16.8; Huron, 15.5; Fort Randall, 13.4; Spearfish, 12.5; Rapid City and Flandreau, 12; Wolsey, 10.5; Clark, Howard, Kimball, Scranton, and Sioux Falls, 10. *Tennessee.*—Union City, 7. *Texas.*—Mountain Spring, 4. *Utah.*—Park City, 33; Parowan, 17; Salt Lake City, 13.1; Nephi, 10.5. *Vermont.*—Strafford, 21.5; Northfield, 18.8; East Berkshire, 17; Lunenburgh, 16.5; Chelsea, 16; Burlington, 14; Vernon, 13; Brattleborough (1), 12.8; Jacksonville, 12. *Virginia.*—Woodstock, 22; Staunton, 21; Dale Enterprise, 19.8; Bolar, 19; Lexington, 17; Salem, 13.6; Yancey's Mills, 12.5; Petersburgh and Stanardsville, 11.5; Bedford City and Christiansburgh, 11. *Washington.*—Chehalis, Seattle, and Walla Walla, 1.1. *West Virginia.*—Mont Alto, 37; Harper's Ferry, 20.1.—*Wisconsin.*—Embarrass, 31; Chippewa Falls, 26.5; Bayfield and De Pere, 24.5; Koepenick and Madison, 24; Lancaster, 23; Menomonie, 22.3; Oconto, 22; Columbus, 21.8; Hillsborough, 21.5; Hayward, 20.2; Butternut and Ithaca, 20; Peshtigo, 19.8; Medford (2), 19.4; Rhinelander, 18.7; La Crosse, 18.5; Green Bay, 18.1; Hammond and Phillips, 18; Beaver Dam and Greenwood, 17; Milwaukee, 16.6; Meadow Valley, 16.4; Cadiz and Whitehall, 16.2; Elroy, 15.4; Manitowoc, 15.2; Appleton (1) and Glasgow, 15; Neillsville, 14; Plover and Hudson, 13.8; Eau Claire, 13.5; Medford (1), 12.8; Oshkosh, 12.7; Prairie du Chien, 12.5; Janesville, 10.5; Fond du Lac, 10. *Wyoming.*—Fort McKinney, 25.2; Camp Pilot Butte, 21.3; Saratoga, 21; Camp Sheridan, 18.8; Wheatland, 16; Cheyenne, 15.3; Laramie, 15.

### DEPTH OF SNOW ON GROUND AT CLOSE OF MONTH.

Chart IV shows the depth of snow reported on the ground at the close of the month. At Cumbres, Colo., 108.5 was reported; more than 20.0 was reported at mountain stations in south-central Pennsylvania, northeast West Virginia, upper Michigan, Colorado, and in northeast-lower Idaho, and a depth of more than 10.0 was noted at stations in New Hampshire, Maine, Michigan, Wisconsin, Nebraska, and Idaho. Trace of snow was reported on the ground from New England southwest, inside the coast line, to western Virginia, and north of a line traced from east Michigan southwestward to extreme north-central New Mexico, thence to south Utah, and thence west of north over the east part of the northern plateau.

### HAIL.

Description of the more severe hail storms of the month is given under "Local Storms." Hail was reported as follows: 1st, Cal. 2d, Ind., N. C., Utah. 3d, Ala., Ill., Ohio, Tenn., Utah. 4th, Utah. 5th, Ala., Cal. 6th, Ala., Ariz., Md., N. C., S. C., Tenn. 7th, Ariz., La., Miss., Mo., Okla. T., Tenn., Tex. 8th, Miss., Tex., Wis. 9th, Mich., Ohio, Tex. 10th, Utah. 11th, Ill., Mo. 12th, Tex. 13th, N. Y., Oregon, Tenn. 15th, Nev., Tex. 16th, Cal. 17th, Kans., Wis. 18th, Ark., Cal. 19th, Ill., Mo. 20th, Colo., Ind., N. Y., N. C., Tex. 21st, Ala., Fla., Ga., Ky., S. C., Tenn., Wis. 22d, Cal., Mass., N. C., Oregon, Utah. 23d, Ariz., Tex. 24th, Ariz., Tex. 25th, Miss., Tex. 26th, Cal., Ga., Ill., Ohio. 27th, Cal., Ky., Ohio, Oregon, Wash. 28th, Colo., Kans., Md., N. J., Oregon, Va. 29th, Iowa, Kans., Mo., Nebr. 30th, Ill., Iowa, Mich., Miss., Tex., Wis. 31st, Ky., Ohio, Utah, Wis.

### SLEET.

Description of the more severe sleet storms of the month is given under "Local Storms." Sleet was reported as follows: 1st, S. C. 2d, Ill., Ind., Kans., Va. 3d, Ill., Kans., Mo., N. C., Ohio, Va., W. Va. 4th, Ind, Kans., N. J., N. Y., N. C., R. I., Utah, W. Va. 5th, Ala., Ariz., Ark., Ga., Ill., Ind., Miss., Mo., N. Mex., N. C., Ohio, S. C., Tenn., Va. 6th, Ariz., Ill., Ind., Ky., Mo., N. J., N. C., Ohio, Tenn., Va. 7th, Ariz., Ill., Kans., Mo., Okla. T., Ohio, Wis. 8th, Ark., Ill., Iowa, La., Mich., Mo., N. J., Pa., Tex., Wis. 9th, Conn., Mont., Ohio, Pa., Tenn., Vt. 10th, Conn., Mo., Vt. 11th, Conn., Ill., Kans., Mo., N. Mex., Tenn. 12th, Ark., Ill., Ind., Ky., La., Ohio, Tenn., Tex. 13th, Ark., Miss., N. Y., Ohio, Tenn., Tex. 16th, N. Mex., Ohio, S. Dak. 17th, Kans., Nebr., Wis. 18th, Ill., Iowa, Kans., Mo., Nev., Ohio, 19th, Ill., Iowa, Ky., Mo., N. Mex., N. Y., Ohio. 20th, Colo., Iowa, Mich., N. J., N. Y., Ohio, Pa., Tenn., W. Va. 21st, Mass., Mo., N. H., Pa. 22d, Ill., Pa., Va. 23d, Colo., Kans., Tex., Wis. 24th, Kans., Mich. 25th, Mo., Tex. 26th, Colo., Ill., Iowa, Mich., N. C., Ohio, W. Va., Wis. 27th, Mich., Nev., Ohio, Va. 28th, Colo., Mich., Nebr., N. C., Va., Wash. 29th, Colo., Iowa, Minn., N. Dak. 30th, Iowa, Mich., Minn., Wis. 31st, Mich., Minn., N. Y., Pa., Wis.

## WINDS.

The prevailing winds during March, 1891, are shown on Chart II by arrows flying with the wind. In New England, the south Atlantic states, the Ohio Valley and Tennessee, the upper Mississippi Valley, and on the middle-eastern slope of the Rocky Mountains the winds were generally from northwest to northeast; in the middle Atlantic states, northeast; over the Florida Peninsula, south to west; in the west Gulf states, northeast to southeast; in the Lake region, northeast to east; in the extreme northwest, northwest to north; in the Missouri Valley, northwest; on the northeast slope of the Rocky Mountains and along the north Pacific coast, southeast to southwest; on the southeast slope of the Rocky Mountains, south to southwest; over the plateau region and on the middle Pacific coast, southwest to northwest; on the south Pacific coast, west to northwest; and in the east Gulf states and the Rio Grande Valley, variable.

### HIGH WINDS.

[In miles per hour.]

Wind velocities of 50 miles, or more, per hour were reported at regular stations of the Signal Service, as follows: 3d, 59, e., at Block Island, R. I. 4th, 62, e., at Block Island, R. I.; 54, sw., at Buffalo, N. Y.; 50, se., at Nantucket, Mass.; 62, nw., at Wood's Holl, Mass. 8th, 50, nw., at Lexington, Ky. 9th, 50, w., at Fort Assinniboine, Mont. 10th, 52, s., at Chicago, Ill. 13th, 60, sw., at Northfield, Vt.; 60, sw., at Buffalo, N. Y. 14th, 50, nw., at Buffalo, N. Y.; 50, w., at Wood's Holl, Mass. 15th, 51, s., at Port Huron, Mich.; 56, sw., at Chicago, Ill. 16th, 50, nw., at Wood's Holl, Mass. 18th, 54, nw., at Keeler, Cal. 19th, 50, sw., at Fort Canby, Wash. 20th, 57, ne., at Block Island, R. I.; 56, se., at Fort Canby, Wash. 21st, 70, ne., at Block Island, R. I.; 50, nw., at Fort McKinney, Wyo. 25th, 50, ne., at Chicago, Ill.

LOCAL STORMS.

**1st.**—A heavy thunder-storm over southeast Massachusetts ended in the early morning. A number of buildings were struck by lightning and burned.

**5th.**—A storm of unusual severity occurred about 4 miles ne. of Wheatland, Cal., about 2 p. m. The storm traveled slowly southeastward and demolished buildings trees, etc., in a path about 300 feet in width. A winery was completely demolished and the heavy timbers scattered in all directions. A blacksmith shop was flattened to the ground. Trees were torn up and carried off. A large shed was lifted 20 feet into the air, and a barley grinder weighing 1,600 pounds was lifted off the ground and carried 10 feet. In crossing Bear River the storm lifted the water drops and vapor 200 feet. The storm was attended with electricity and hail and appeared to form by the coming together of 2 sets of clouds traveling in opposite directions.

**7th.**—A severe storm prevailed over west-central Mississippi. In the east part of Warren county a storm moved north in a path about 50 yards in width about 8 p. m., eastern time, killing 6 persons, and destroying property to the estimated value of over $50,000. Heavy rain preceded and attended the storm, with vivid lightning and loud thunder. A thunder-storm with heavy rain occurred at Vicksburg in the morning. The night of the 7–8th severe storms were reported in Rankin, Holmes, and Madison counties, Miss. At Brandon, Rankin Co., a storm moved ne., with heavy rain, thunder, and vivid lightning. The storm was attended by a roaring sound and appeared to have a whirling motion, as articles were carried up and trees were thrown in all directions. The path of the storm extended about 3 miles, and the damage to buildings, etc., amounted to about $10,000. A report of this storm states that a piece of scantling was blown through a hard packed bale of cotton, and that a large wagon wheel was blown off, the spokes torn out, and the tire wrapped around a log. At Cameron, Madison Co., Miss., a storm moved ne., in a path about 200 yards in width, attended by a roaring sound, and terrific thunder and lightning. A very small quantity of hail fell, and the rain was heaviest after the passage of the storm. The storm had a whirling motion from right to left, and trees, etc., were thrown in all directions. No lives were lost. Property was destroyed to the value of about $5,000. The storm was also very severe in Holmes Co., Miss., where a number of houses were destroyed, and several persons were reported killed and injured. At Memphis, Tenn., the barometer fell rapidly the morning of the 7th, the decrease in pressure being .20 in less than one hour, about 11 a. m., when a gale from the nw. began. At Nashville, Tenn., a heavy rain and thunder-storm occurred in the early morning, and a building was struck by lightning and burned. The heavy rainfall caused serious damage to railroad and other property in west Mississippi and Tennessee. At Shreveport, La., a thunder-storm from the nw. occurred in the afternoon, during which a house was struck by lightning. A house near Belmont, S. C., was struck by lightning.

**8th.**—A very heavy thunder-storm, with excessive rainfall, occurred at Meridian, Miss., in the early morning. Railroads were under water for several miles, many bridges were washed away, crops were injured, houses were flooded in Meridian, and communication with the surrounding country was cut off by flooded streams. The damage in and about Meridian was estimated at $30,000. A severe storm was reported at Salem, Lee Co., Ala. At Lumpkin, Stewart Co., Ga., a heavy thunder and rain storm washed out roads, etc. Very heavy rainfall and heavy winds were reported in parts of South Carolina, and a high tide was reported at Tampa, Fla. A heavy gale, with high tides, prevailed on Puget Sound and over west Washington. **9th.**—A severe storm of wind and rain prevailed at Block Island, R. I.; the tide was high and vessels remained in the harbor. A thunder-storm, with heavy rain, was reported along the Hudson River at night. **12th.**—A heavy storm occurred at Mesquite, Tex.; rain froze as it fell, doing much damage. **13th.**—A gale, with wind changing from se. to s. and to sw. at night, rain, and dense fog, prevailed at Vineyard Haven, Mass. At 10.15 p. m., in a dense fog, the U. S. S. "Galena" ran ashore at Gay Head, Martha's Vineyard. A severe gale set in from the sw. at Buffalo, N. Y., at 1 p. m. and continued until after midnight, reaching a velocity of 60 miles per hour at 1.58 p. m., and causing considerable damage to buildings, etc. The barometer fell .20 from 8 to 10 a. m., and reached 28.40 (actual) at 1.35 p. m., after which it rose rapidly. At Hess Road Station, N. Y., a light ne. wind lulled at 1.40 p. m., and a black mass of clouds began to form 10 to 12 miles out on Lake Ontario, nw. by n. from station. The wind increased steadily in force, changing to wsw. and reaching nearly 70 miles per hour. The top of the mass of cloud was about 15° above the horizon. The storm was attended by a roaring sound, and the centre passed to the north of the place of observation at 2 p. m. The temperature rose until 2.30 p. m., when it suddenly fell 16°; the barometer had been falling 3 days. The cloud was inky black, and rolled and tumbled without any seeming direction, but sloping backward or toward the west; near the centre was a fixed gray streak or line which grew larger as it neared the top, this was supposed to be water. The whole mass kept its general form, but gradually lost its density and color. Mr. C. S. Spaulding, the voluntary observer at Hess Road Station, states that storms of this description always form in about the same locality as the one above described, pass inland, never reaching a point farther south than the limestone ridge, or about 12 miles from the lake shore, move nearly in a semicircle, and again reach the lake at or near Thirty-mile Point. At Pittsburgh, Pa., a sw. gale, with snow and rain, prevailed in the morning. The wind reached 45 miles per hour at 11 a. m., the highest wind velocity ever noted at that station, causing considerable damage.

**17th.**—High ne. winds prevailed at Charleston, S. C., and a schooner went ashore and was wrecked. **17–18th.**—A "norther" prevailed in California and Nevada, with wind 25 to over 50 miles per hour. At Keeler, Cal., the wind shifted to nw. at 7 p. m., 18th, and in 15 minutes attained a velocity of 54 miles per hour, the highest velocity ever noted at that station. The temperature fell from 60° to 34° in 2 hours, and at 7.15 p. m. rain began and changed to snow. **20th.**—A severe ne. gale, with heavy rain, prevailed along the New Jersey coast, causing unusually high tides. **21st.**—At 7.40 a. m. a thunder-storm passed north of Eustis, Fla.; 0.90 inch of rain fell in 25 minutes; 3.73 inches fell from 7.40 a. m. to 5 p. m., and very heavy rain and hail was reported at neighboring towns. At Orlando, Fla., considerable damage was caused by heavy hail. A severe thunder-storm, with heavy rain, passed southeast over Charleston, S. C., in the evening. **22d.**—A heavy thunder-storm, with rain and hail and a gale from the ne., prevailed at Kitty Hawk, N. C., during the early morning. Great damage was caused along the New Jersey coast by heavy wind and high seas. **24th.**—During a n. gale the steamship "Traiharly" ran ashore at Chicamicomico, N. C. The ship went to pieces, and 19 of the crew, including the captain and officers, were drowned; 7 were saved. **26th.**—A heavy ne. wind and rain storm prevailed at Birdsnest, Va. A heavy hail storm was reported in Pike Co., Ga. **27th.**—Heavy rain fell at Key West, Fla., in the morning; 0.42 inch fell in 10 minutes, and in a squall from the sw. the wind reached 30 miles per hour for 5 minutes. Brisk and high winds, with rain and lightning, prevailed at Hatteras, N. C. The Spanish steamship "Bovinquen," from Galveston for London, went ashore 5 miles s. of Hatteras Inlet; the crew was saved. At Cape Henry, Va., a severe wind and rain storm prevailed. At 10 a. m. the Nor. bk. "Dictator" went ashore about 6 miles s. of the station, and 7 persons were drowned. The storm was also severe over Chesapeake Bay and along the New Jersey coast. **29th.**—A heavy rain storm visited the region about Galena, Ill., causing considerable damage. A severe storm was reported in north Dickinson county, Kans.,

in the morning. **30th.**—A thunder-storm, with heavy rain, began at Indianapolis, Ind., about noon. A church was struck by lightning and damaged to the extent of about $500. A destructive storm was reported in the south part of Claiborne Co., La., in the evening. **31st.**—Owing to darkness and heavy rain the steamer "City of Detroit," from Detroit to Cleveland, ran on a rock at the "Lime Kilns" and sunk. No lives were lost.

## INLAND NAVIGATION.

### FLOODS.

The month opened with high water in the Mississippi River from Cairo, Ill., southward, and high water prevailed in many of the tributaries of the lower Mississippi. On the 1st the stage of the Ohio River at Cincinnati, Ohio, was 50.3 feet, 5.3 feet above the danger-line, and the stage of the water at Louisville, Ky., was 30.4 feet, 6.4 feet above the danger-line. On the 4th the Mississippi River reached 46.2 feet at Cairo, Ill., at which point it remained almost stationary until after the 6th. At Yuma, Ariz., the east bound passenger train which arrived on the morning of February 22d returned to California, offering the first opportunity to forward mail since February 21st. On the 4th the levee on the Sacramento River opposite Sacramento, Cal., broke at 12.30 p. m., partially flooding the town of Washington. The gauge reading was 26.7 feet. On the 5th the river rose to 26.9 feet and a levee about 3 miles below Sacramento, on the Yolo county side, gave way. The break was only a short distance below the great break of December, 1889, and the stage of the water was only 1 inch lower than at that time. On the 5th and 6th the Tennessee River was rising at Chattanooga, Tenn. On the 7th the river was falling at Cairo, Ill. At Chattanooga, Tenn., the Tennessee River continued to rise.

On the 8th the river continued to rise at Chattanooga, Tenn.; the backwater was encroaching on the lowlands in south Chattanooga, and the residents were moving to higher ground. On the 9th the river continued to rise at Chattanooga, Tenn.; buildings along the river front and in the lowlands were flooded and railroad trains were abandoned. At 8 a. m. the Savannah River stood at 31.2 feet at Augusta, Ga. The west and south edges of the city were completely inundated; street cars were compelled to stop running, and towards night a general cessation of business was caused by the rapidly encroaching water. River and streams were generally high in Georgia. High water was generally reported in streams in Alabama and Mississippi. At Nashville, Tenn., the Cumberland River was rising and much damage was caused to property in low-lying sections. At Lynchburgh, Va., the James River was very high. On the 10th, at 2 p. m., the Cumberland River was 47.8 feet at Nashville, Tenn., and stationary. Streets in the lower part of the city were flooded and considerable damage was caused. On the 10th the Savannah River reached 35.5 feet at Augusta, Ga., after which it fell slowly. At Chattanooga, Tenn., the Tennessee River rose slowly; trains on the mountain railroads were stopped by high water, and the Belt Road trains ran through 2 inches of water near the National Cemetery. The first break in the lower Mississippi levees occurred at Vidalia, La., opposite Natchez, Miss.; 450 yards of the levee caved in; no damage done. The Mississippi River reached 34.9 feet at Memphis, Tenn., 1.9 foot above the danger line. On the 11th the Tennessee River reached 38.9 feet, 5.9 feet above the danger-line, at Chattanooga, Tenn., and then began to fall. A crevasse occurred at night in the levee at Hill House, near Sunflower Landing, Coahoma Co., Miss. At Nashville, Tenn., the Cumberland River was 47.9 feet and stationary. On the 14th the Cumberland River reached 49.3 feet, 9.3 feet above the danger-line, at Nashville, Tenn. At New Orleans, La., the water washed over the bank at noon, but the break was quickly repaired and no damage resulted.

On the 16th an overflow occurred at the foot of Girard street, New Orleans, La., but a protection levee was immediately put up, forcing the water back in the river. A break in the Bayou La Fourche levee was reported in the morning. On the 17th the first serious break in the levees near New Orleans, La., occurred on the Ames Plantation, nearly opposite Audubon Park, in the upper end of the city. The break was nearly 100 feet wide and 15 feet deep. Algiers and Gretna, 2 small villages near the crevasse, and a number of small farms were threatened with overflow. The river reached 16.4 feet, 3.4 feet above the danger-line, at New Orleans, La. On the 18th the Ames crevasse widened rapidly, and the water covered the tracks of the South Pacific and Texas Pacific Railroads, seriously interfering with traffic on those lines. The stage of the river continued at 16.4 feet. On the 19th the Ames crevasse continued to widen. On the 20th the Ames crevasse continued to widen, but as a protection levee had been constructed it was thought that no damage would be done at Gretna and Algiers. On the 21st the back levee at Concordia, East Carroll Parish, La., broke in the morning and widened rapidly. On the 22–23d serious freshets were reported in rivers and streams in Maine and New Hampshire. On the 23d the Ames crevasse at New Orleans was about 600 feet wide. The break at Concordia was 600 feet wide. On the 24–25th the Little Colorado River was very high at Holbrook, Ariz., and the span of telegraph line crossing the river was washed away. On the 27th the flood at Holbrook, Ariz., had abated. On the 31st the river was 42.2 feet and rising at Cairo, Ill. At Vicksburg, Miss., it reached 48.0 feet, 7.0 feet above the danger-line, and at New Orleans, La., the river was falling slowly.

### ICE IN RIVERS AND HARBORS AND OPENING OF NAVIGATION.

*Penobscot River.*—On the 21st a heavy ice gorge was reported at Veazie, Me.

*Lake Champlain.*—The lake was frozen at Burlington, Vt., on the 5th.

*Susquehanna River.*—At Lock Haven, Pa., the river was partly frozen on the 1st; floating ice, 2d; partly frozen, 3d; river clear of ice, 10th. At Wilkes Barre floating ice was reported from the 1st to 3d.

*Hudson River.*—The first boat of the season arrived at Albany from New York City on the 25th.

The Morris Canal was open for navigation on the 30th.

*Detroit River.*—Considerable ice in the river on the 1st; floating ice, 3d; river clear of ice, 5th; floating ice, 10th. The first trip of the season was made on the 12th by the steamer "City of Detroit," running between Detroit and Cleveland. On the 25th navigation was opened on the Detroit River as far north as Lake Saint Clair Flats, at which point an ice gorge had formed.

*Mississippi River.*—Floating ice at Alton, Ill., 1st to 15th. At Davenport, Iowa, the ice went out of the river on the 10th. On the 18th the ferry boat began making regular trips. Navigation opened on the 25th. On the 27th the river was reported free from ice between Winona, Minn., and La Crosse, Wis. On the 29th the ice was breaking up at Red Wing, Minn. On the 30th the river was clear of ice at Saint Paul, Minn.

*Missouri River.*—Floating ice at Herrmann, Mo., 3d to 6th, and 9th. At Saint Joseph's Bridge, Mo., ice was running in the river, 1st and 2d; river blocked by ice, 3d; ice broke up 16th; running ice, 17th; river clear of ice, 18th. On the 4th the pontoon bridge across the river at Saint Charles, Mo., was swept away by flood and heavy ice. On the 26th ice was running in open places at Fort Sully, S. Dak., and on the 31st the river was rising and the water running over the ice. On the 28th the water was running over the ice at Fort Buford, N. Dak. On the 29th the Yellowstone River opened, causing the ice in the Missouri River at Fort Buford, N. Dak., to break,

and the ice ran out freely for a few hours, after which it stopped moving. During the 30th–31st the ice gorge continued at Fort Buford. On the 31st navigation opened at Sioux City, Iowa.

*Lake Erie.*—On the 4th the ice on the lake and in the river was broken up by a severe gale; 10th, ice considerably broken by a gale; 15th, ice badly broken by a gale and drifting down the river in large fields; 23d, ice drifting down the river in large fields. On the 5th the inner harbor at Cleveland, Ohio, was full of ice from 4 to 6 inches thick, and outside of the breakwater ice 6 to 10 inches thick extended as far as could be seen; this ice was driven in by a ne. wind. On the 10th nearly all the ice was driven out of the harbor by s. wind. On the 12th the first steamer of the season arrived from Detroit and returned on the 15th, being the first departure of the season. On the 24th the lake was covered with pack ice as far as could be seen. On the 29th no ice was visible.

*Lake Huron.*—On the 23d the south end of the lake was covered with floating ice and the Saint Clair River was full of floating ice. The night of the 24th communication by boat with points south of Marine City was closed, and on the 25th navigation was entirely closed on the Saint Clair River. On the 30th the ice jam in the Saint Clair River at Marine City gave way and navigation between local points resumed. On the 31st the lake was covered with floating ice at Port Huron and there was no marked indication of a resumption of navigation. At Alpena, Mich., the river and bay were clear of ice on the 28th. A schooner which left for Sand Beach on that date was obliged to return on account of ice in Thunder Bay.

*Lake Michigan.*—On the 3d 5 steamers were fast in the ice at Milwaukee, Wis.; 5th, ice drifted into harbor and the harbor was blocked by ice at night; 6th, the wind piled the ice on shore; 9th, harbor free of ice. On the 29th 2 boats, the first of the season, arrived at Manistee, Mich., and the channel was free of ice at Green Bay, Wis.

*Heights of rivers above low-water mark, March, 1891 (in feet and tenths).*

| Stations. | Danger-point on gauge. | Highest water. | | Lowest water. | | Monthly range. |
|---|---|---|---|---|---|---|
| | | Date. | Height. | Date. | Height. | |
| *Red River.* | | | | | | |
| Shreveport, La | 29.9 | 1 | 21.2 | 30 | 15.9 | 5.3 |
| *Arkansas River.* | | | | | | |
| Fort Smith, Ark | 22.0 | 31 | 12.9 | 23 | 3.8 | 9.1 |
| Little Rock, Ark | 23.0 | 1, 10 | 12.7 | 28 | 8.5 | 4.2 |
| *Missouri River.* | | | | | | |
| Fort Buford, N. Dak* | | | | | | |
| Kansas City, Mo | 21.0 | 27 | 12.2 | 2 | 4.0 | 8.2 |
| *Mississippi River.* | | | | | | |
| Saint Paul, Minn* | 14.0 | | | | | |
| La Crosse, Wis* | 13.0 | | | | | |
| Dubuque, Iowa* | 16.0 | | | | | |
| Davenport, Iowa† | 15.0 | 25 | 7.1 | 12 | 2.3 | 4.8 |
| Keokuk, Iowa | 14.0 | 28 | 11.0 | 16 | 1.8 | 9.2 |
| Saint Louis, Mo | 30.0 | 30, 31 | 19.3 | 15, 16 | 6.8 | 12.5 |
| Cairo, Ill | 40.0 | 4, 5, 6 | 46.2 | 30 | 41.9 | 4.3 |
| Memphis, Tenn | 33.0 | 10 | 34.9 | 1 | 33.0 | 1.9 |
| Vicksburg, Miss | 41.0 | 31 | 48.0 | 1 | 43.5 | 4.5 |
| New Orleans, La | 13.0 | 17, 18 | 16.4 | 1 | 14.7 | 1.7 |
| *Ohio River.* | | | | | | |
| Pittsburgh, Pa | 22.0 | 14 | 13.8 | 7, 8 | 6.1 | 7.7 |
| Parkersburgh, W. Va | 38.0 | 16 | 21.9 | 7 | 10.4 | 11.5 |
| Cincinnati, Ohio | 45.0 | 1 | 50.3 | 24 | 32.2 | 18.1 |
| Louisville, Ky | 24.0 | 1 | 30.4 | 25, 26 | 12.1 | 18.3 |
| *Cumberland River.* | | | | | | |
| Nashville, Tenn | 40.0 | 14 | 49.3 | 25 | 12.5 | 36.8 |
| *Tennessee River.* | | | | | | |
| Chattanooga, Tenn | 33.0 | 11 | 38.9 | 26 | 10.4 | 28.5 |
| Knoxville, Tenn | 29.0 | 10 | 16.9 | 26 | 5.0 | 11.9 |
| *Monongahela River.* | | | | | | |
| Pittsburgh, Pa | 29.0 | 14 | 13.8 | 7, 8 | 6.1 | 7.7 |
| *Savannah River.* | | | | | | |
| Augusta, Ga | 32.0 | 10 | 35.5 | 4, 5 | 11.8 | 23.7 |
| *Willamette River.* | | | | | | |
| Portland, Oregon | 15.0 | 28 | 6.0 | 8 | 1.9 | 4.1 |

*Frozen. †For 21 days.

## ATMOSPHERIC ELECTRICITY.

### AURORAS.

Auroras were reported as follow: 3d, Clinton and Marshalltown, Iowa; Eastport, Me.; Fort Buford, N. Dak.; Kimball and Webster, S. Dak.; Medford, Wis. 4th, Clinton, Iowa. 5th, Ship Island, Miss. 6th, Clinton and Webster City, Iowa; Eastport, Me. 11th, Montevideo, Minn. 12th, Alta, Iowa; Caldwell, Mich.; Morris, Minn.; Webster, S. Dak. 13th, Saint Paul, Minn; Ithaca, N. Y. 14th, Eastport, Me.; Cambridge and Fall River, Mass.; University, Miss. (first ever observed); Wedgewood, N. Y. 15th, Eastport, Me. 16th, Bar Harbor, Me.; Eagle's Mere, Pa. 17th, Alta, Iowa; Orono, Me. 18th, Webster City, Iowa. 26th, Coopersburgh, Pa. 28th, Amherst, Mass. 29th, New Hartford, Conn.; Moorestown, N. J. 30th, New Hartford, Southington, and Voluntown, Conn.; Sandwich, Ill.; Cornish and Orono, Me.; Amherst, Blue Hill Observatory, Cambridge, Concord, Fall River, Newburyport, North Billerica, and Royalston, Mass.; Berlin Mills, Groveton, Nashua, and Plymouth, N. H.; Moorestown, N. J.; Lowville and Wedgewood, N. Y.; Dyberry and Eagle's Mere, Pa.; East Berkshire and Northfield, Vt. 31st, Alta, Iowa; Eastport and Orono, Me.; Plymouth, N. H.; Kimball, S. Dak.; Northfield, Vt.

### THUNDER-STORMS.

Thunder-storms were reported as follows: east of the Rocky Mountains thunder-storms were reported in the greatest number of states, 16, on the 7th; in 15 on the 30th; in 11 on the 21st and 29th; in 10 on the 8th; in 9 on the 9th; in 8 on the 6th, 20th, 22d, 25th, and 26th; in 7 on the 31st; in 6 on the 3d and 18th; in 4 on the 2d, 19th, 24th, 27th, and 28th; in 3 on the 5th, 10th, and 12th; in 2 on the 1st, 11th, 13th, 16th, 17th, and 23d, and in 1 on the 15th. The 4th and 14th were the only dates on which no thunder-storms were reported.

East of the Rocky Mountains thunder-storms were reported on the greatest number of dates, 13, in Ky. and Tex.; on 12 in N. C. and Tenn.; on 11 in Fla.; on 10 in Ill., Miss., and Mo.; on 9 in S. C.; on 8 in Ala., Ark., and La.; on 7 in Ga. and Kans.; on 4 in Ind.; on 3 in Iowa, Mass., N. J., and Okla. T.; on 2 in Conn., Md., Minn., Nebr., N. H., Ohio, Pa., Va., and Wis.; and on 1 in Mich., N. Y., and W. Va. West of the Rocky Mountains thunder-storms were reported as follows: Ariz., 6th, 11th, 18th, 21st to 24th, 30th, and 31st; Cal., 1st, 5th, 15th, 16th, 22d, 26th, and 27th; Colo., 17th and 28th; Idaho, 25th, 26th, and 27th; N. Mex., 11th, 21st, 22d, and 23d; Utah, 22d, 27th, and 31st. In Del., D. C., Ind. T., Me., Mont., Nev., N. Dak., Oregon, R. I., S. Dak., Vt., Wash., and Wyo., no thunder-storms were reported.

## MISCELLANEOUS PHENOMENA.

### SUN SPOTS.

Mr. D. E. Hadden, Alta, Iowa: 1st, 1 group, 2 spots; group in faculæ w. 3d, faculæ disappearing by rotation on w. limb. 5th, 1 group, 1 spot; group e. limb by rotation. 6th, 2 groups, 3 spots; groups e. and se.; faculæ e. and w. 8th, 1 group, 4 spots. 9th, 1 group, 6 spots; faculæ e. 10th, 1 group, 6 or 8 spots; group n. latitude on meridian. 11th, 1 group, 4 spots. 12th, 1 group, 2 spots; prominent faculæ by rotation on se. limb, followed by aurora in the evening; faculæ near e. and w. limbs. 13th, 1 group, 1 spot; large spot by rotation, just in on e. limb; group which was nw. on 12th had vanished. 14th, 1 group, 1 spot; faculæ by rotation se. limb. 15th, 1

group, 1 spot; faculæ disappearing by rotation on w. and nw. limbs; group faculæ by rotation on e. limb; large spot, had well developed umbra and penumbra. 16th, 2 groups, 3 spots; small new group nw. 17th, 2 groups, 6? spots; could not see faculæ or count spots. 18th, 2 groups, 5 spots; large group faculæ by rotation on e. limb; aurora preceding evening; large spot n. latitude, other group nw. limb. 19th, 2 groups, 3 spots; large spot on meridian; group in faculæ disappearing by rotation nw. limb. 20th, 1 group, 1 spot. 22d, 1 group 1 spot nw.; faculæ w. 27th, faculæ e. and w. 30th, 1 group, 1 spot; single glimpses through clouds; group about 1 day in on e. limb, with umbra and penumbra. Cloudy 2d, 7th, 21st, 23d to 26th, 28th, 29th, and 31st.

Mr. John W. James, Riley, Ill.: none seen until 5th, then large spot near east edge; prominent faculæ and faint spot on southeast edge. 6th to 8th cloudy. 9th 1 group near sun's meridian in north latitude. 12th, 13th, prominent faculæ on southeast edge. 13th, the large spot that disappeared by solar rotation February 26th reappeared on east edge. 14–17th, only this one spot seen. 18th–22d, cloudy. 23d, this large spot 2 days from west edge. 24th, cloudy. 25th, no spots. 26–28th, cloudy. 29th, 1 large new spot on east edge. 30th, 31st cloudy.

Mr. H. D. Gowey, North Lewisburgh, Ohio: sun spots were observed on the 10th, 15th, 16th, 17th, and 29th.

Haverford College Observatory, Pa. (observed by Prof. F. P. Leavenworth):

| Date. | Number of new— | | Disappeared by solar rotation. | | Reappeared by solar rotation. | | Total number visible. | | Faculæ. | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|
| | Groups. | Spots. | Groups. | Spots. | Groups. | Spots. | Groups. | Spots. | Groups. | |
| *March*, 1891. | | | | | | | | | | |
| 1, 10 a. m... | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 9 | 1 | Definition poor: spots small. |
| 2, 9 a. m... | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 5 | 1 | Definition bad. |
| 4, 12 m ..... | 2 | 4 | 0 | 0 | 0 | 0 | 2 | 4 | 3 | Definition fair; 1 large spot. |
| 5, 10 a. m... | 1 | 2 | 0 | 0 | 0 | 0 | 3 | 6 | 3 | Definition fair; 1 large spot. |
| 6, 10 a. m... | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | .... | Definition bad. |
| 10, 9 a. m... | 0 | 16 | 0 | 0 | 0 | 0 | 1 | 18 | 0 | Definition fair. |
| 11, 9 a. m... | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 19 | 1 | Definition fair. |
| 14, 9 a. m... | 1 | 1 | 0 | 0 | 0 | 0 | 2 | 3 | 3 | Definition good; 1 large spot. |
| 15, 9 a. m... | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 3 | Definition poor; 1 large spot. |
| 16, 9 a. m... | 2 | 7 | 0 | 0 | 0 | 0 | 3 | 8 | 1 | Definition poor; 1 large spot. |
| 17, 9 a. m... | 0 | 3 | 0 | 0 | 0 | 0 | 2 | 9 | 1 | Definition poor; 1 large spot. |
| 18, 10 a. m... | 1 | 8 | 0 | 0 | 0 | 0 | 3 | 17 | 2 | Definition good; 1 large spot. |
| 23, 3 p. m... | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 7 | 1 | Definition fair; 1 large spot. |
| 24, 3 p. m... | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | Definition poor. |
| 25, 9 a. m... | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 5 | Definition fair. |
| 29, 3 p. m... | 4 | 20 | 1 | 1 | 0 | 0 | 4 | 20 | 2 | Definition fair; 1 large spot. |
| 30, 9 a. m... | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 8 | 2 | Definition poor. |

## VERIFICATIONS.

[Verifications made by Assistant Professor C. F. Marvin, assisted by Mr. H. E. Williams, chief clerk of the Forecast Division.]

### FORECASTS FOR 24 HOURS IN ADVANCE.

The forecasts for districts east of the Rocky Mountains for March, 1891, were made by assistant Professor H. A. Hazen, Signal Service, and those for the Pacific coast districts were made at San Francisco, Cal., by 2d Lieutenant John P. Finley, 19th Infantry.

*Percentages of forecasts verified, March*, 1891.

| States. | | States. | |
|---|---|---|---|
| Maine | 85.4 | Kentucky | 79.9 |
| New Hampshire | 79.4 | Ohio | 83.9 |
| Vermont | 79.8 | West Virginia | 83.2 |
| Massachusetts | 75.3 | Indiana | 79.4 |
| Rhode Island | 76.5 | Illinois | 81.1 |
| Connecticut | 80.8 | Lower Michigan | 79.4 |
| Eastern New York | 76.6 | Upper Michigan | 84.5 |
| Western New York | 77.1 | Wisconsin | 87.7 |
| Eastern Pennsylvania | 87.4 | Minnesota | 83.5 |
| Western Pennsylvania | 81.9 | Iowa | 81.8 |
| New Jersey | 84.3 | Kansas | 80.0 |
| Delaware | 87.9 | Nebraska | 81.2 |
| Maryland | 86.3 | Missouri | 89.9 |
| District of Columbia | 85.7 | Colorado | 79.5 |
| Virginia | 83.9 | North Dakota | 77.7 |
| North Carolina | 81.3 | South Dakota | 82.7 |
| South Carolina | 79.7 | Southern California* | 93.0 |
| Georgia | 79.5 | Northern California* | 81.7 |
| Eastern Florida | 86.7 | Oregon* | 78.5 |
| Western Florida | 83.9 | Washington* | 84.1 |
| Alabama | 80.5 | *By elements:* Weather | 87.2 |
| Mississippi | 81.1 | Temperature† | 73.0 |
| Louisiana | 74.9 | Monthly percentage of weather and temperature combined‡ | 81.5 |
| Texas | 80.3 | | |
| Arkansas | 78.3 | | |
| Tennessee | 75.9 | | |

*In determining the monthly percentage of weather and temperature combined, the Pacific coast states are not included. †The forecasts of temperature in districts east of the Rocky Mountains for March, 1891, were made with reference to the maximum temperature alone; that is, a prediction of warmer or cooler indicated that the maximum temperature of the day designated would be higher or lower than the maximum of the previous day. ‡The monthly percentage of weather and temperature combined is determined by multiplying the percentage of weather by 6, and the percentage of temperature by 4, and dividing their sum by 10.

### FORECASTS FOR 48 AND 72 HOURS IN ADVANCE.

Appreciating the great importance that long time predictions possess for the general public the Chief Signal Officer has authorized forecasts for 48 and 72 hours, covering the 2d and 3d days in advance. These are optional with the forecast official, and are only made when clearly in the public interest, and cover, in all cases, considerable areas of country, and are not confined to localities.

Percentages of verifications of forecasts made for second day in advance. Number of predictions made: weather, 49; temperature, 23. Percentages of verifications: weather, 76.9; temperature, 100.0; weather and temperature combined, 82.4.

Percentages of verifications of forecasts made for third day in advance. Number of predictions made: weather, 6; percentage, 53.3.

### WIND SIGNALS FOR MARCH, 1891.

Statement showing percentages of justifications of wind signals for the month of March, 1891:

*Wind signals.*—(Ordered by Assistant Professor H. A. Hazen). Total number of signals ordered, 114; justified as to velocity, wholly, 94, partly, 7; justified as to direction, 111. Of the signals ordered 79 were cautionary, of which 63 were wholly and 4 partly justified; and 35 were storm signals, of which 31 were wholly, and 3 partly justified. 69 signals were ordered for easterly winds, of which 67 were justified, and 45 were ordered for westerly winds, of which 44 were justified. Percentage of justifications, 82.1.

### COLD-WAVE SIGNALS AND TEMPERATURE-FALL WARNINGS.

[Ordered by Assistant Professor T. Russell.]

Number of cold-wave signals ordered, 114; justified, 59. Percentage of justifications, 51.8. Number of temperature-fall warnings, 74; justified, 26. Percentage of justifications, 35.1. Percentage of justifications of cold-wave signals and temperature-fall warnings combined, 47.7.

*Percentages of verifications of weather and temperature signals reported by directors of the various State Weather Services for March*, 1891.

| States. | Weather. | Temperature. | States. | Weather. | Temperature. |
|---|---|---|---|---|---|
| Illinois | 75 | 66 | New Jersey | 85 | 88 |
| Indiana | 86 | 89 | New York | 83 | 88 |
| Iowa | 78 | 90 | North and South Dakota | 73 | 84 |
| Kansas | 89 | 92 | Ohio | 92 | 95 |
| Michigan | 83 | 83 | Pennsylvania | 90 | 90 |
| Minnesota | 77 | 81 | South Carolina | 79 | 81 |
| Missouri | 79 | 85 | | | |

## STATE WEATHER SERVICES.

[*Temperature in degrees Fahrenheit; precipitation, including melted snow, in inches and hundredths.*]

**The following extracts and summaries are republished from reports for March, 1891, of the directors of the various state weather services:**

### ALABAMA.

*Temperature.*—Maximum, 85, at Wiggins, 24th; minimum, 20, at Valley Head, 15th; greatest monthly range, 53, at Jasper; least monthly range, 29, at Chepultepec.

*Precipitation.*—Greatest monthly, 11.62, at Jasper; least monthly, 4.60, at Goodwater.

*Wind.*—Prevailing direction, east.—*Prof. P. H. Mell, Auburn, director; J. M. Quarles, Private, Signal Corps, assistant.*

### ARKANSAS.

*Temperature.*—The mean was 3.9 below the normal, and was the coldest March since 1879; maximum, 79, at Greenville, Miss., 29th; minimum, 10, at Ozone, 4th; greatest monthly range, 62, at Fayetteville; least monthly range. 44, at Brinkley.

*Precipitation.*—The average was 1.06 above the normal; greatest monthly, 8.82, at Osceola; least monthly, 1.51, at Rogers.

*Wind.*—Prevailing direction, south.—*M. F. Locke, Commissioner of Agriculture, Little Rock, director; F. H. Clarke, Sergeant, Signal Corps, assistant.*

### COLORADO.

The month was colder and wetter than usual.

*Temperature.*—Maximum, 75, at Lamar, 16th; minimum, —41, at Breckenridge, 7th; greatest monthly range, 101, at Breckenridge; least monthly range, 52, at Climax and San Luis.

*Precipitation.*—The average was considerably above the normal; greatest monthly, 6.40, at Cumbres; least monthly, 0.19, at Thon.—*W. S. Miller, Sergeant, Signal Corps, Denver, assistant.*

### ILLINOIS.

*Temperature.*—The mean was 3.4 below the normal of the last 13 years; maximum, 70, at Flora, 8th; minimum, 0, at Aurora, 1st.

*Precipitation.*—The average was 0.38 above the normal of the last 13 years; greatest monthly, 6.62, at Golconda; least monthly, 1.64, at Riley.

*Wind.*—Prevailing direction, northeast.—*John Craig, Sergeant, Signal Corps, Springfield, in charge.*

### INDIANA.

*Temperature.*—Maximum, 72, at Huntingburgh, 18th; minimum, —5, at Delphi, 1st; greatest monthly range, 69, at La Fayette; least monthly range, 45, at Columbus.

*Precipitation.*—Greatest monthly, 8.50, at Marengo; least monthly, 3.07, at Columbia City.

*Wind.*—Prevailing direction, northeast.—*Prof. H. A. Huston, La Fayette, director; C. F. R. Wappenhans, Sergeant, Signal Corps, assistant.*

### IOWA WEATHER AND CROP SERVICE.

The month was the coldest and most disagreeable March in the last 15 years.

*Temperature.*—Maximum, 66, at Glenwood, 17th; minimum, —19, at Larrabee, 4th; greatest monthly range, 74, at Glenwood; least monthly range, 46, at Osage.

*Precipitation.*—The average was 0.47 above the normal; greatest monthly, 4.58, at Fairfield; least monthly, 1.33, at Storm Lake.

*Wind.*—Prevailing direction, northeast.—*J. R. Sage, Des Moines, director; G. M. Chappel, Observer, Signal Service, assistant.*

### KANSAS.

This was the coldest March since the establishment of the station.

*Temperature.*—The mean ranged from 5.5 below the normal in the eastern part of the state to 9.4 below in the western part; maximum, 78, at Shields, 21st and 31st; minimum, —8, at Concordia (near), 4th; greatest monthly range, 76, at Oakley; least monthly range, 61, at Halstead.

*Precipitation.*—The average was in excess of the normal in all parts of the state, except in the extreme southeastern portion; greatest monthly, 6.50, at Alton; least monthly, 1.00, at Page City.

*Wind.*—Prevailing direction, north.—*Prof. J. T. Lovewell, Topeka, director; T. B. Jennings, Sergeant, Signal Corps, assistant.*

### KENTUCKY.

*Temperature.*—The mean was about 4.0 below the normal; maximum, 71, at Harrodsburgh, Frankfort, and Richmond, 8th; minimum, 9, at Princeton, 15th; greatest monthly range, 59, at Shelbyville; least monthly range, 47, at Canton.

*Precipitation.*—Greatest monthly, 9.75, at Franklin; least monthly, 6.57, at Louisville.

*Wind.*—Prevailing direction, northwest.—*Dr. E. A. Grant, Louisville, director; Frank Burke, Sergeant, Signal Corps, assistant.*

### LOUISIANA.

*Temperature.*—Maximum, 84, at Houma, 6th; minimum, 26, at Liberty Hill, 9th; greatest monthly range, 55, at Liberty Hill; least monthly range, 33, at Port Eads.

*Precipitation.*—Greatest monthly, 8.15, at Winnsborough; least monthly, 0.80, at Grand Coteau,

*Wind.*—Prevailing direction, south.—*George E. Hunt, Sergeant, Signal Corps, New Orleans, in charge.*

### MICHIGAN.

*Temperature.*—The mean was 1.3 below the normal of the last 15 years; maximum, 61, at Benton Harbor, 29th; minimum, —27, at Roscommon, 1st; greatest monthly range, 79, at Roscommon; least monthly range, 36, at Bell Branch.

*Precipitation.*—The average was 0.11 above the normal of the last 15 years; greatest monthly, 5.81, at Bellaire; least monthly, 0.60, at Ionia.

*Wind.*—Prevailing direction, northeast.—*N. B. Conger, Sergeant, Signal Corps, Lansing, director.*

### MINNESOTA.

*Temperature.*—Maximum, 58, at Crookston, 28th; minimum, —40, at Pokegama Falls, 1st; greatest monthly range, 89, at Pokegama Falls; least monthly range, 50, at Duluth and Saint Charles.

*Precipitation.*—Greatest monthly, 3.50, at Farmington; least monthly, 0.49, at Crookston.

*Wind.*—Prevailing direction, northeast—*John Healy, Sergeant, Signal Corps, Minneapolis, in charge.*

### MISSISSIPPI.

*Temperature.*—The mean was 1.7 below the normal; maximum, 89, at Summit, 30th; minimum, 25, at Boonville, 14th; greatest monthly range, 57, at Summit; least monthly range, 32, at Bay Saint Louis.

*Precipitation.*—The average was 1.69 above the normal; greatest monthly, 15.50, at Kosciusko; least monthly, 1.46, at Summit.—*R. B. Fulton, Signal Corps, University, director.*

### MISSOURI.

*Temperature.*—The mean was 5.0 below the normal; maximum, 78, at Lebanon, 23d; minimum, —11, at Excelsior Springs, 9th; greatest monthly range, 78, at Marshall; least monthly range, 43, at Warrenton.

*Precipitation.*—The average was 0.50 above the normal; greatest monthly, 5.88, at Princeton; least monthly, 1.00, at Cassville.—*Levi Chubbuck, Secretary of State Board of Agriculture, Columbia, director; A. L. McRae, Sergeant, Signal Corps, assistant.*

### NEBRASKA.

The month was cold, cloudy, and snowy, unfavorable to early farming, but leaving the ground in excellent condition for crops.

*Temperature.*—The mean was about 6.0 below the normal in the southeastern part of the state; maximum, 74, at Bassett; minimum, —23, at Oakdale.

*Precipitation.*—The distribution of rain and snow was quite irregular; greatest monthly, 3.56, at Minden; least monthly, 0.75, at West Point.—*Prof. Goodwin D. Swezey, Crete, director; G. A. Loveland, Sergeant, Signal Corps, assistant.*

### NEVADA.

*Temperature.*—The mean was 1.4 below the normal; maximum, 78, at Yount's Ranch, 21st; minimum, 2, at Eureka, 6th; greatest monthly range, 65, at Pioche; least monthly range, 38, at Humboldt.

*Precipitation.*—The average was 0.18 above the normal; greatest monthly, 4.56, at Lewer's Ranch; least monthly, trace, at Mill City.

*Wind.*—Prevailing direction, southwest.—*Prof. Charles W. Friend, Carson City, director; D. C. Grunow, Corporal, Signal Corps, assistant.*

### NEW ENGLAND METEOROLOGICAL SOCIETY.

*Temperature.*—The mean was 0.3 above the normal; maximum, 63, at New Haven, 23d; minimum, —22, at Berlin Falls, 2d; greatest monthly range, 76, at West Milan and Jacksonville; least monthly range, 34, at Provincetown.

*Precipitation.*—The average was 0.54 above the normal; greatest monthly, 7.97, at Kingston (2); least monthly, 0.98, at Florida.

*Wind.*—Prevailing direction, northwest.—*Prof. William H. Niles, Boston, Mass., president; Prof. Winslow Upton, Providence, R. I., secretary; J. Warren Smith, Private, Signal Corps, assistant.*

### NEW JERSEY.

*Temperature.*—The mean was 0.4 above the normal; maximum, 68, at Paterson, 23d and 24th; minimum, 4, at Dover, 2d; greatest monthly range, 59, at Dover; least monthly range, 37, at Ocean City.

*Precipitation.*—The average was 1.47 above the normal; greatest monthly, 8.02, at Bridgeton; least monthly, 2.05, at Paterson.

*Wind.*—Prevailing direction, northeast.—*E. W. McGann, Sergeant, Signal Corps, New Brunswick, in charge.*

### NEW YORK.

*Temperature.*—Maximum, 67, at Brentwood; minimum, —18, at Constableville, 2d; greatest monthly range, 72, at Number Four; least monthly range, 44, at Fort Porter and Hess Road Station.

*Precipitation.*—Greatest monthly, 7.40, at Le Roy; least monthly, 0.61, at Fort Porter.

*Wind.*—Prevailing directions, northwest and southwest.—*Prof. E. A. Fuertes, Dean of the College of Civil Engineering, Cornell University, Ithaca, director; R. M. Hardinge, Private, Signal Corps. assistant.*

### NORTH CAROLINA.

*Temperature.*—The mean was 3.4 below the normal; maximum, 77, at Marshallberg, 9th; minimum, 14, at Asheville, 15th; greatest monthly range, 56, at Asheville; least monthly range, 40, at Southport.

*Precipitation.*—The average was 2.50 above the normal; greatest monthly, 11.67, at Hendersonville; least monthly, 4.83, at Southport.

*Wind.*—Prevailing direction, northeast.—*Dr. Herbert B. Battle, Raleigh, director; C. F. von Herrmann, Sergeant, Signal Corps. assistant.*

### NORTH AND SOUTH DAKOTA.

*Temperature.*—The mean was 4.0 below the normal; maximum, 64, at Rapid City, S. Dak., 21st; minimum, —36, at Wahpeton, N. Dak., 1st; greatest monthly range, 92, at New England City, N. Dak.; least monthly range, 62, at Napoleon, N. Dak.

*Precipitation.*—The average was about 0.54 above the normal; greatest monthly 6.76, at Webster, S. Dak.; least monthly, 0.20, at Oelrichs, S. Dak.

*Wind.*—Prevailing direction, northwest.—*S. W. Glenn, Sergeant, Signal Corps, Huron, S. Dak., in charge.*

### OHIO.

*Temperature.*—The mean was normal; maximum, 74, at Portsmouth, 18th; minimum, —5, at Wapakoneta, 5th, and it was the lowest minimum temperature recorded for March since 1888.

*Precipitation.*—The average was 1.26 above the normal; greatest monthly, 6.25, at Georgetown; least monthly, 2.27, at Toledo and Sandusky.

*Wind.*—Prevailing direction, northeast.—*Prof. B. F. Thomas, Columbus, director; C. M. Strong, Sergeant, Signal Corps, secretary and assistant.*

### OREGON.

Unusually cool, cloudy weather and frequent showers delayed farm work.

*Temperature.*—The mean was 2.8 below the normal; maximum, 70, at Grant's Pass, 20th; minimum, —8, at Lone Rock and Joseph, 3d,

*Precipitation.*—The average was 1.20 below the normal; greatest monthly, 6.52, at Cascade Locks; least monthly, 0.53, at The Dalles.

*Wind.*—Prevailing direction, southwest.—*Hon. H. E. Hayes, Master State Grange, Oswego, director; B. S. Pague, Sergeant, Signal Corps, assistant.*

### PENNSYLVANIA.

*Temperature.*—The mean was nearly 2.0 below the normal; maximum, 60, at Pittsburgh and Uniontown, 18th; minimum, —14, at Dyberry and Columbus, 2d; greatest monthly range, 70, at Dyberry and Smethport; least monthly range, 43, at Harrisburg.

*Precipitation.*—The average was about 2.00 above the normal; greatest monthly, 8.39, at Selin's Grove; least monthly, 2.44, at Erie.

*Wind.*—Prevailing direction, northeast.—*Under direction of the Franklin Institute, Philadelphia; T. F. Townsend, Observer, Signal Service, assistant.*

### SOUTH CAROLINA.

*Temperature.*—Maximum, 78, at Trial, 8th; minimum, 20, at Evergreen, 15th; greatest monthly range, 50, at Conway; least monthly range, 31, at Trial.

*Precipitation.*—Greatest monthly, 12.47, at Yorkville; least monthly, 4.82, at Port Royal.

*Wind.*—Prevailing direction, northeast.—*A. P. Butler, director, State Weather Service, and observer, Signal Service.*

### TENNESSEE.

The characteristics of the month were low temperature and excess in rainfall. Farming operations were greatly delayed.

*Temperature.*—The mean was slightly below the normal; maximum, 76, at Memphis, 29th; minimum, 14, at Northville, 15th; greatest monthly range, 56, at Springdale,; least monthly range, 41, at Florence Station.

*Precipitation.*—The average was about 3.50 above the normal, and it was the heaviest rainfall in the last 9 years; greatest monthly, 12.42, at Hohenwald; least monthly, 4.05, at Johnson City.

*Wind.*—Prevailing directions, north and east.—*J. D. Plunket, M. D., Nashville, director; H. C. Bate, Signal Corps, assistant.*

### TEXAS.

*Temperature.*—The mean was about 2.0 below the normal over the extreme western and northwestern parts of the state, elsewhere it was from 4.0 to 6.0 below; maximum, 94, at Rio Grande City, 7th; minimum, 4, at Panhandle, 8th; greatest monthly range, 78, at Wichita Falls; least monthly range, 46, at Brownsville.

*Precipitation.*—The average was about normal over the western and central parts of the state, and from 2.00 to 4.00 below, with a few exceptions, over the extreme eastern and southern parts; greatest monthly, 3.56, at Longview; least monthly, 0.00, at Victoria.—*D. D. Bryan, Galveston, director; I. M. Cline, Sergeant, Signal Corps, assistant.*

### WISCONSIN.

*Temperature.*—The mean was 4.2 below the normal; maximum, 58, at Prairie du Chein, 17th; minimum, —44, at Rhinelander, 1st.

*Precipitation.*—The average was about 0.38 above the normal; greatest monthly, 5.05, at Embarrass; least monthly, 0.94, at Saint Paul, Minn.

*Wind.*—Prevailing direction, northeast.—*R. E. Kerkam, Milwaukee, Sergeant, Signal Corps, in charge.*

*Meteorological record of Army post surgeons, voluntary, and other co-operating observers, March, 1891.*

| Stations. | Temperature. (Fahrenheit.) Max. | Min. | Mean. | Precip'n. |
|---|---|---|---|---|
| *Alabama.* | ° | ° | ° | *Ins.* |
| Bermuda *† | 80 | 31 | 49.2 | 5.81 |
| Bessemer | 78 | 28 | 53.9 | 8.56 |
| Brewton † | 81 | 31 | 57.7 | 5.75 |
| Chepultepec † | 60 | 31 | 45.0 | 9.45 |
| Childersburgh | | | | 9.07 |
| Citronelle † | 810 | 31 | 61.39 | 5.96 |
| Claiborne Landing | | | | 7.46 |
| Columbiana † | 76 | 24 | 52.8 | 8.09 |
| Cordova † | | | | 10.46 |
| Decatur (1) † | | | | 9.43 |
| Double Springs † | 72 | 25 | 51.3 | 9.28 |
| Florence | | | | 11.80 |
| Gadsden † | | | | 6.69 |
| Goodwater † | 68 | 30 | 51.7 | 4.60 |
| Greensborough † | 78 | 30 | 53.7 | 8.86 |
| Jasper † | 75 | 22 | 49.8 | 11.62 |
| Livingston (1) *† | 79 | 34 | 53.6 | 9.90 |
| Mountain Home | 72 | 21 | 48.0 | 8.44 |
| Mount Willing † | 71 | 32 | 51.4 | 6.90 |
| Mt. Vernon B'ks | 80 | 34 | 56.8 | 6.76 |
| Selma (1) | | | | 5.89 |
| Sturdevant † | | | | 9.64 |
| Talladega | | | | 9.07 |
| Tallassee Falls | | | | 9.45 |
| Tuscaloosa | | | | 9.38 |
| Tuscumbia (1) † | 72 | 27 | 46.5 | 10.03 |
| Uniontown † | 77 | 31 | 54.0 | 8.04 |
| Valley Head † | 72 | 20 | 45.8 | 8.18 |
| Warrior † | | | | 7.95 |
| Wiggins † | 85 | 32 | 58.0 | 7.96 |
| *Alaska.* | | | | |
| Juneau | 50 | 11 | 34.9 | 5.68 |
| Killisnoo | 49 | 23 | 36.0 | 7.05 |
| *Arizona.* | | | | |
| Ariz. Canal Co. Dam. | 85 | 34 | 58.8 | 0.37 |
| Bisbee | 76 | 26 | 50.2 | 0.75 |
| Buckeye | | | | T. |
| Calabasas | | | | 0.30 |
| Casa Grande * | 76 | 38 | 45.7 | 0.00 |
| Chino | 82 | 24 | 49.9 | 4.02 |
| Chiri Cahua M't's | | | | 0.00 |
| Chloride | 74 | 25 | 50.6 | 0.78 |
| Cooleys | 63 | 7 | 36.5 | 2.21 |
| Dragoon † | | | | 0.38 |
| Dragoon Summit * | 70 | 35 | 53.1 | 0.36 |
| Dos Cabezos † | | | | 0.54 |
| Dudleyville | | | | 0.47 |
| Eagle Pass | | 26 | 41.9 | 0.58 |
| Farley's Camp | | 32 | 57.0 | 0.45 |
| Florence | 83 | 26 | 55.5 | 0.11 |
| Fort Apache | 69 | 4 | 41.8 | 0.85 |
| Fort Bowie | 71 | 26 | 51.3 | 0.65 |
| Fort Grant | 73 | 22 | 49.8 | 0.28 |
| Fort Huachuca | 71 | 29 | 48.0 | 0.74 |
| Fort Mojave | 89 | 34 | 60.4 | 0.10 |
| Gila Bend (1) * | 78 | 44 | 63.0 | |
| Gila Bend (2) * | 90 | 42 | 63.8 | 0.11 |
| Grand Central Mill | | | | 0.35 |
| Holbrook † | 72 | — 4 | 43.0 | 1.24 |
| Maricopa (1) * | 72 | 51 | 59.2 | 0.00 |
| Mount Huachuca | 74 | 27 | 49.6 | 2.00 |
| Natural Bridge † | | | | 1.81 |
| Oro | | | | 0.30 |
| Pantano * | 80 | 36 | 57.1 | 0.85 |
| Payson | | | | 1.00 |
| Red Rock | | | | 0.00 |
| San Carlos | 90 | 24 | 56.1 | 0.47 |
| San Simon | 79 | 30 | 57.5 | 0.30 |
| Show Low † | | | | 1.10 |
| Signal † | 83 | 31 | 57.4 | T. |
| Simmons | | | | T. |
| Springerville | | | | 0.40 |
| Tempe | 80 | 30 | 57.0 | T. |
| Teviston | | | | 1.25 |
| Texas Hill * | 85 | 40 | 62.3 | 0.00 |
| Tip Top † | 86 | 46 | 56.8 | 0.67 |
| Tucson (1) † | 81 | 30 | 57.0 | 0.16 |
| Tucson (2) * | 80 | 40 | 59.8 | 0.17 |
| Walnut Grove | | | | 0.60 |
| Walnut Ranch | | | | 0.51 |
| Whipple Barracks | 78 | 11 | 43.1 | 0.86 |
| Willcox * | 77 | 30 | 57.0 | 0.26 |
| Wilgus | | | | 0.40 |
| Yuma | 85 | 48 | 66.4 | 0.00 |
| *Arkansas.* | | | | |
| Arkansas City † | | | | 8.56 |
| Brinkley | 66 | 22 | 44.6 | 5.63 |
| Camden † | 77 | 26 | 50.6 | 6.57 |
| Conway | 71 | 19 | 46.6 | 5.64 |
| Dallas | 70 | 17 | 45.6 | 4.09 |
| Dardanelle | | | | 3.62 |
| Devall's Bluff | 77 | 15 | 47.7 | 7.15 |
| Fayetteville *† | 75 | 13 | 41.4 | 1.98 |
| Forrest City † | 76 | 32 | 54.4 | 6.70 |
| Fulton † | | | | 1.97 |
| Harrisburgh | 72 | 18 | 45.2 | 7.57 |
| Helena (1) † | | | | 8.80 |
| Helena (2) | 72 | 28 | 49.7 | 7.91 |
| Hot Springs | 82 | 17 | 46.0 | 6.51 |
| Lead Hill * | 75 | 14 | 45.0 | 3.00 |
| Lonoke | 77 | 21 | 50.8 | 6.94 |
| Malvern | | | | 4.13 |
| Mount Nebo | 65 | 15 | 43.0 | 2.54 |

| Stations. | Temperature. (Fahrenheit.) Max. | Min. | Mean | Precip'n. |
|---|---|---|---|---|
| *Arkansas*—Cont'd. | ° | ° | ° | *Ins.* |
| Newport (1) † | | | | 5.39 |
| Newport (2) | 74 | 20 | 42.8 | 5.28 |
| Osceola | 69 | 21 | 46.0 | 8.82 |
| Ozone | 64 | 10 | 42.2 | 3.79 |
| Paragould † | 70 | 20 | 44.8 | 5.32 |
| Pine Bluff | 78 | 22 | 48.8 | 6.87 |
| Rogers † | 74 | 14 | 42.7 | 1.51 |
| Stuttgart | 78 | 22 | 48.6 | 5.92 |
| Texarkana | 75 | 26 | 53.0 | 3.14 |
| Winslow | 68 | 16 | 41.2 | 2.28 |
| *California.* | | | | |
| Alcade * | 78 | 46 | 58.7 | 1.69 |
| Alcatraz Island | 63 | 40 | 52.4 | 2.66 |
| Almaden * | 72 | 38 | 55.1 | 2.85 |
| Anaheim * | 80 | 46 | 58.1 | 0.59 |
| Anderson | 81 | 37 | 58.2 | 4.16 |
| Angel Island | 73 | 35 | 53.4 | 2.53 |
| Antioch * | 68 | 41 | 52.6 | 1.55 |
| Aptos * | 72 | 34 | 53.9 | 3.01 |
| Athlone * | 83 | 35 | 54.3 | 1.10 |
| Auburn | 74 | 36 | 52.2 | 5.40 |
| Bakersfield * | 77 | 42 | 58.0 | 0.25 |
| Ballast Point L. H. | | | | 0.70 |
| Barstow | 76 | 33 | 55.9 | T. |
| Belmont * | 78 | 39 | 55.0 | 0.00 |
| Benicia Barracks | 78 | 37 | 54.6 | 1.04 |
| Berendo * | 76 | 40 | 55.7 | 1.17 |
| Berkeley | 70 | 40 | 51.9 | 3.17 |
| Boca * | 65 | —10 | 34.3 | 2.50 |
| Borden * | 76 | 34 | 53.0 | 0.77 |
| Boulder Creek | 90 | 30 | 52.3 | 5.57 |
| Brentwood | 71 | 42 | 54.1 | 3.80 |
| Brighton * | 76 | 41 | 57.9 | 2.22 |
| Byron * | 76 | 42 | 58.2 | 1.99 |
| Caliente | 73 | 40 | 52.6 | 0.40 |
| Calistoga * | 80 | 32 | 52.0 | 1.45 |
| Cp. Mendocino LH. | | | | 5.52 |
| Castroville * | 78 | 39 | 57.2 | 1.35 |
| Centreville * | 82 | 45 | 57.9 | 2.57 |
| Chico * | 76 | 36 | 55.1 | 1.23 |
| Cisco * | 43 | 18 | 31.9 | 6.45 |
| Colfax * | 70 | 30 | 51.1 | 9.60 |
| Colton * | 80 | 36 | 55.9 | 0.25 |
| Corning | 75 | 43 | 55.0 | 1.52 |
| Crescent City | | | | 8.14 |
| Crescent City L. H. | | | | 8.58 |
| Davisville * | 78 | 42 | 59.5 | 1.45 |
| Delano * | 79 | 39 | 58.0 | 0.57 |
| Delta * | 70 | 35 | 52.6 | 2.06 |
| Downey * | 75 | 43 | 55.2 | 0.00 |
| Dunnigan | 67 | 37 | 53.0 | 0.66 |
| Dunsmuir | 65 | 34 | 45.2 | 2.70 |
| East Brother L. H. | | | | 0.76 |
| El Dorado * | 74 | 34 | 51.5 | 6.71 |
| Elmira * | 76 | 42 | 57.2 | 1.65 |
| El Verano * | 76 | 38 | 55.2 | 1.91 |
| Emigrant Gap * | 56 | 18 | 33.4 | 4.55 |
| Esparto * | 77 | 40 | 56.1 | 0.63 |
| Evergreen | | | | 2.18 |
| Farmington * | 75 | 35 | 54.8 | 4.04 |
| Farrallon L. H. | | | | 0.24 |
| Felton * | 81 | 30 | 54.6 | 6.43 |
| Fernando * | 79 | 40 | 59.9 | 1.23 |
| Florence * | 79 | 44 | 58.6 | 0.19 |
| Folsom * | 71 | 38 | 57.3 | 5.29 |
| Fort Bidwell | 59 | 13 | 37.4 | 3.83 |
| Fort Gaston | 74 | 31 | 50.0 | 5.83 |
| Fort Mason | 68 | 41 | 52.6 | 1.55 |
| Fruto * | 77 | 37 | 55.1 | 0.52 |
| Galt | 78 | 35 | 56.3 | 2.78 |
| Georgetown † | 73 | 25 | 48.0 | 10.00 |
| Gilroy * | 75 | 36 | 53.7 | 0.97 |
| Girard * | 65 | 30 | 46.0 | 0.00 |
| Glen Ellen | 73 | 35 | 53.3 | 1.17 |
| Goshen * | 75 | 30 | 53.6 | 0.82 |
| Grass Valley | | | | 6.22 |
| Haywards * | 66 | 38 | 52.4 | 1.95 |
| Hollister * | 85 | 32 | 56.5 | 1.35 |
| Hornbrook * | 68 | 25 | 45.6 | 0.67 |
| Humboldt L. H. | | | | 5.82 |
| Hydesville | 66 | 31 | 50.6 | 5.26 |
| Indio | 94 | 50 | 68.3 | 0.00 |
| Ione | 74 | 31 | 54.9 | 4.15 |
| Iowa Hill * | 77 | 29 | 48.6 | 8.28 |
| Jolon | | | | 0.99 |
| Julian † | 72 | 28 | 46.5 | 2.09 |
| Keeler | 75 | 33 | 57.0 | 2.01 |
| Keene * | 65 | 33 | 48.6 | 1.30 |
| Kingsburgh * | 78 | 40 | 55.0 | 0.90 |
| King City * | 70 | 28 | 48.3 | 0.52 |
| Knight's Landing * | 66 | 40 | 56.6 | 0.00 |
| Lathrop * | 83 | 37 | 54.7 | 1.36 |
| Laurel * | 81 | 31 | 52.7 | 7.94 |
| Lemoore * | 86 | 35 | 56.5 | 0.64 |
| Line Point L. H. | | | | 2.50 |
| Livermore * | 84 | 34 | 57.2 | 2.50 |
| Livingston * | 80 | 39 | 55.4 | 1.74 |
| Long Beach * | 80 | 40 | 57.5 | 0.00 |
| Los Angeles * | 80 | 44 | 58.4 | 0.51 |
| Los Banos * | 72 | 44 | 58.6 | 0.39 |
| Los Gatos (1) * | 74 | 34 | 55.0 | 4.41 |
| Los Gatos (2) | 72 | 35 | 52.3 | 4.65 |
| Mammoth Tank | 90 | 48 | 65.3 | 0.00 |

*Meteorological record of voluntary observers, &c.*—Continued.

| Stations. | Temperature. (Fahrenheit.) Max. | Min. | Mean | Precip'n. |
|---|---|---|---|---|
| *California*—Cont'd. | ° | ° | ° | *Ins.* |
| Mare Island L. H | ..... | ..... | ..... | 1.87 |
| Martinez* | 68 | 36 | 53.2 | 1.76 |
| Marysville* | 80 | 40 | 62.3 | 0.86 |
| Menlo Park* | 74 | 37 | 55.4 | 2.17 |
| Merced * | 84 | 33 | 50.9 | 1.29 |
| Milton (near) | 68 | 38 | 54.7 | 3.55 |
| Modesto * | 86 | 40 | 57.5 | 0.74 |
| Mojave * | 76 | 32 | 52.3 | 0.19 |
| Monson * | 75 | 35 | 55.2 | 1.01 |
| Montague * | 70 | 36 | 48.5 | 0.75 |
| Monterey * | 68 | 34 | 51.7 | 0.95 |
| Monterey (Hotel del Monte) | 67 | 43 | 56.3 | 0.00 |
| Mullans | 74 | 34 | 53.6 | 0.85 |
| Napa City* | 72 | 34 | 55.3 | 2.33 |
| Newark * | 77 | 40 | 59.1 | 2.40 |
| Newhall * | 84 | 32 | 54.4 | 0.88 |
| Newman* | 76 | 50 | 61.3 | 1.82 |
| Niles * | 70 | 37 | 56.9 | 2.65 |
| Norwalk * | 74 | 45 | 57.1 | 0.57 |
| Oakland (1) | 75 | 35 | 53.5 | 3.10 |
| Oakland (2)* | 68 | 40 | 54.8 | 2.52 |
| Ogilby | 92 | 51 | 66.5 | 0.00 |
| Ontario | 70 | 40 | 53.5 | 0.45 |
| Orland * | 80 | 40 | 55.1 | 0.33 |
| Oroville * | 75 | 44 | 55.6 | 0.69 |
| Pajaro * | 72 | 34 | 51.6 | 2.53 |
| Palermo † | 73 | 35 | 54.2 | 1.83 |
| Paso Robles * | 74 | 29 | 52.0 | 2.51 |
| Piedras Blancas L H | ..... | ..... | ..... | 1.59 |
| Pigeon Point L. H | ..... | ..... | ..... | 1.07 |
| Placerville (1)* | 72 | 34 | 51.0 | 7.82 |
| Placerville (2)* | 68 | 26 | 47.4 | 8.18 |
| Pt. Ano Nuevo L.H. | ..... | ..... | ..... | 1.20 |
| Point Arena L. H | ..... | ..... | ..... | 2.26 |
| Point Bonita L. H | ..... | ..... | ..... | 2.82 |
| Pt. Conception L.H. | ..... | ..... | ..... | 1.09 |
| Point Fermin L. H. | ..... | ..... | ..... | 0.35 |
| Pt. Hueneme L. H | ..... | ..... | ..... | 1.63 |
| Point Montaro L.H. | ..... | ..... | ..... | 1.90 |
| Point Pinos L. H. | ..... | ..... | ..... | 0.95 |
| Point Reyes L. H. | ..... | ..... | ..... | 2.38 |
| Point Sur L. H. | ..... | ..... | ..... | 1.62 |
| Pomona * | 84 | 35 | 57.9 | 0.80 |
| Portersville * | 78 | 34 | 56.3 | 0.71 |
| Presidio of San F | 78 | 38 | 53.2 | 0.50 |
| Puente * | 84 | 43 | 59.4 | 0.11 |
| Ravenna * | 78 | 28 | 51.8 | 0.90 |
| Redding * | 79 | 30 | 53.9 | 3.05 |
| Riverside | 84 | 32 | 53.8 | 0.28 |
| Rock Island L. H | ..... | ..... | ..... | 1.72 |
| Rocklin * | 78 | 36 | 57.4 | 3.27 |
| Rumsey * | 75 | 40 | 57.0 | 1.16 |
| Sacramento (1) | 73 | 31 | 51.7 | 1.87 |
| Sacramento (2)* | 74 | 42 | 55.0 | 1.45 |
| Salinas (1) * | 78 | 34 | 51.5 | 0.43 |
| Salinas (2)* | 65 | 42 | 52.7 | 1.05 |
| Salton * | 95 | 38 | 66.9 | 0.00 |
| Sanger Junction* | 79 | 33 | 57.5 | 0.45 |
| San Ardo* | 82 | 32 | 53.1 | 0.76 |
| San Diego B'ks | 41 | 26 | 58.1 | 0.25 |
| San Gabriel * | 80 | 43 | 59.5 | 0.12 |
| San José * | 76 | 38 | 54.4 | 2.46 |
| San Luis L. H. | ..... | ..... | ..... | 2.08 |
| San Mateo * | 72 | 39 | 52.7 | 2.57 |
| San Miguel* | 73 | 32 | 51.8 | 2.67 |
| San Pedro* | 72 | 45 | 59.4 | 0.25 |
| Santa Ana* | 84 | 40 | 62.0 | 0.69 |
| Santa Barbara (1) | 78 | 39 | 56.6 | 1.56 |
| Santa Barbara (2)* | 79 | 47 | 58.0 | 1.65 |
| Santa Barbara L. H. | ..... | ..... | ..... | 1.07 |
| Santa Clara | ..... | ..... | ..... | 2.16 |
| Santa Cruz (1)* | 72 | 37 | 55.2 | 1.98 |
| Santa Cruz (2)* | 72 | 34 | 53.4 | 1.35 |
| Santa Cruz L. H. | ..... | ..... | ..... | 1.90 |
| Santa Margarita* | 70 | 27 | 46.2 | 3.18 |
| Santa Maria | ..... | ..... | ..... | 0.71 |
| Santa Monica* | 80 | 40 | 58.1 | 0.82 |
| Santa Paula* | 78 | 44 | 58.1 | 2.40 |
| Selma* | 76 | 34 | 51.9 | 0.47 |
| Seven Palms* | 92 | 52 | 67.3 | 0.00 |
| Shingle Springs* | 63 | 30 | 49.9 | 7.97 |
| Sims* | 74 | 28 | 46.3 | 2.85 |
| Soledad* | 80 | 38 | 54.3 | 0.42 |
| Sonoma | 72 | 36 | 55.6 | 2.43 |
| Soquel * | 78 | 36 | 57.4 | 0.00 |
| South Vallejo* | 65 | 35 | 53.2 | 1.58 |
| Spadra * | 80 | 35 | 55.9 | 0.34 |
| Steeles† | 77 | 38 | 55.3 | 3.20 |
| Stockton (2)* | 67 | 41 | 55.3 | 1.14 |
| Summit* | 42 | 20 | 31.6 | 5.10 |
| Suisun City* | 82 | 42 | 57.6 | 1.00 |
| Susanville | 60 | 12 | 38.9 | 2.49 |
| Tehachapi * | 62 | 26 | 43.1 | 0.80 |
| Templeton* | 78 | 32 | 54.2 | 2.72 |
| Towles * | 70 | 20 | 45.0 | 10.52 |
| Tracy * | 74 | 45 | 53.0 | 1.70 |
| Traver * | 77 | 40 | 57.5 | 0.78 |
| Trinidad L. H. | ..... | ..... | ..... | 6.62 |
| Tropico* | 77 | 32 | 58.0 | 0.45 |
| Truckee (1) | 50 | 2 | 33.9 | 3.92 |
| Tulare * | 80 | 42 | 59.7 | 0.48 |
| Turlock * | 75 | 40 | 56.1 | 1.95 |
| Upper Mattole | 78 | 38 | 55.9 | 7.85 |
| Vacaville (1)* | 78 | 40 | 56.0 | 0.57 |
| Vacaville (2)* | 78 | 42 | 57.0 | 1.02 |
| Valley Springs* | 73 | 32 | 54.2 | 7.45 |
| Vina* | 78 | 36 | 56.0 | 0.50 |
| Volcano Springs * | 96 | 42 | 66.8 | 0.00 |
| Volta * | 78 | 45 | 57.3 | 0.76 |
| Walla Walla Ck | 62 | 22 | 41.8 | 2.03 |
| Walnut Creek | 80 | 36 | 56.9 | 3.15 |
| Westley * | 73 | 45 | 61.0 | 1.46 |
| Wheatland | 76 | 34 | 54.3 | 1.41 |
| Whittier | 85 | 41 | 61.1 | 0.40 |
| Williams * | 70 | 39 | 54.2 | 0.35 |
| Willow (1) | 76 | 35 | 53.2 | 0.62 |
| Willow (2) | 73 | 31 | 49.6 | 0.96 |
| Winters * | 84 | 46 | 59.9 | 1.10 |
| Woodland | 68 | 32 | 48.8 | 0.35 |
| Yerba Buena L. H. | ..... | ..... | ..... | 0.37 |
| Yreka† | 67 | 22 | 43.6 | 1.15 |
| *Colorado.* | | | | |
| Abbott† | ..... | ..... | ..... | 1.80 |
| Agate * | 62 | 0 | 30.0 | 1.72 |
| Akron*† | 62 | — 3 | 26.2 | 2.00 |
| Alford | ..... | ..... | ..... | 1.49 |
| Almat | 44 | —19 | 16.2 | 1.70 |
| Amherst† | ..... | ..... | ..... | 1.70 |
| Antonito | ..... | ..... | ..... | 0.50 |
| Apishapa† | 48 | —10 | 30.9 | 1.85 |
| Arboles† | ..... | ..... | ..... | 2.35 |
| Aroya | ..... | ..... | ..... | 0.70 |
| Beaver Creek† | ..... | ..... | ..... | 1.22 |
| Bennet* | 65 | 8 | 28.8 | 1.40 |
| Box Elder † | ..... | ..... | ..... | 2.52 |
| Brandon | ..... | ..... | ..... | 1.20 |
| Breckenridge† | 60 | —41 | 12.9 | 4.15 |
| Brush† | ..... | ..... | ..... | 2.15 |
| Burlington† | 67 | —15 | 25.4 | 3.00 |
| Byers* | 60 | 0 | 28.1 | 1.48 |
| Cañon City† | 69 | 9 | 36.8 | 1.53 |
| Castle Rock† | 70 | 1 | 32.2 | 1.29 |
| Cheyenne Wells | 68 | 10 | 37.1 | 1.00 |
| Climax *† | 38 | —14 | 14.0 | 3.95 |
| Crook | 60 | —12 | 28.2 | 1.89 |
| Cumbres | 45 | —12 | 20.2 | 6.40 |
| Deer Trail * | 60 | 2 | 32.4 | 1.00 |
| Delta † | 66 | 7 | 36.9 | 2.00 |
| Dillon † | ..... | ..... | ..... | 3.14 |
| Elkhorn † | ..... | ..... | ..... | 3.05 |
| First View* | 66 | 0 | 33.3 | 0.80 |
| Fort Lewis | 53 | —11 | 27.0 | 2.40 |
| Fort Logan | 70 | 0 | 32.2 | 2.50 |
| Georgetown o | 51 | 14 | 30.3 | 1.60 |
| Greenhorn† | 65 | — 7 | 32.6 | 2.14 |
| Gunnison | ..... | —34 | ..... | ..... |
| Hugo * | 68 | 8 | 32.8 | ..... |
| Husted † | 69 | — 5 | 32.2 | 1.87 |
| Idaho Springs† | 58 | 0 | 28.4 | 2.13 |
| Julesburg | 68 | — 8 | 25.0 | 1.65 |
| Kirk † | ..... | ..... | ..... | 0.95 |
| Kit Carson* | 72 | 5 | 32.2 | 1.30 |
| Lamar † | 75 | — 4 | 32.6 | 4.61 |
| Las Animas† | 70 | — 6 | 33.2 | 2.43 |
| Lay † | ..... | ..... | ..... | 1.05 |
| Leadville † | 44 | —11 | 19.6 | 4.65 |
| Le Roy *† | 59 | — 7 | 24.5 | 1.99 |
| Livermore | 60 | — 4 | 30.4 | 1.26 |
| Longmont | 64 | 2 | 32.6 | 1.44 |
| Magnolia* | 56 | — 2 | 28.1 | 2.90 |
| Meeker | 55 | —12 | 29.4 | 1.73 |
| Minneapolis † | ..... | ..... | ..... | 1.64 |
| Monte Vista (1)† | 54 | — 1 | 29.5 | 1.11 |
| Montrose (near) † | ..... | ..... | ..... | 0.73 |
| Pagoda (near)* | 53 | —16 | 28.7 | ..... |
| Parachute † | ..... | ..... | ..... | 2.31 |
| Red Cliff† | ..... | ..... | ..... | 2.80 |
| Rico* † | ..... | ..... | ..... | 2.10 |
| Rifle Falls | 58 | — 4 | 29.8 | 3.01 |
| River Bend * | 70 | 10 | 32.0 | ..... |
| Rocky Ford† | 74 | — 6 | 23.5 | 1.70 |
| Saint Cloud † | ..... | ..... | ..... | 3.20 |
| Sanborn † | ..... | ..... | ..... | 0.57 |
| San Luis † | 55 | 3 | 32.6 | 2.57 |
| Sedgwick | ..... | ..... | ..... | 0.30 |
| Sheridan Lake*† | 68 | 5 | 31.6 | 1.60 |
| Smoky Hill Mine † | 52 | — 6 | 27.4 | 5.60 |
| Springfield | ..... | ..... | ..... | 1.82 |
| Stamford† | ..... | ..... | ..... | 3.80 |
| Stunner † | 60 | —10 | 24.7 | 2.80 |
| T. S. Ranch † | 69 | 4 | 35.6 | 1.95 |
| Thon † | 72 | 2 | 33.2 | 0.19 |
| Vilas | ..... | ..... | ..... | 1.30 |
| Villa Grove† | ..... | ..... | ..... | 1.42 |
| Watervale † | ..... | ..... | ..... | 1.65 |
| Westcliffe † | 55 | — 3 | 27.0 | 1.25 |
| Wray † | ..... | ..... | ..... | 1.90 |
| Yuma † | ..... | ..... | ..... | 3.63 |
| *Connecticut.* | | | | |
| Canton | 58 | — 2 | 31.9 | 5.10 |
| Colchester | 60 | 4 | 38.8 | ..... |
| Falls Village | ..... | ..... | ..... | 2.17 |
| Fort Trumbull | 61 | 9 | 37.4 | 4.36 |
| Hartford (1) | 57 | 3 | 33.6 | 5.44 |
| Hartford (2) | ..... | ..... | ..... | 5.46 |
| Lake Konomoc | ..... | ..... | ..... | 6.11 |
| Lebanon | ..... | ..... | ..... | 4.78 |
| Mansfield | 54 | 0 | 31.9 | 4.42 |
| Middletown | 61 | 5 | 34.3 | 5.96 |
| New Hartford (1)* | 52 | — 6 | 28.0 | 4.52 |
| New Hartford (2) | ..... | ..... | ..... | 5.50 |
| N. Grosvenor Dale | 53 | 5 | 33.0 | 5.35 |
| Norwalk | 63 | 5 | 35.4 | 0.97 |
| Shelton | 60 | 7 | 34.8 | 4.56 |
| Southington* | 53 | 2 | 32.8 | 5.95 |
| South Manchester | ..... | ..... | ..... | 3.61 |
| Stevenson | ..... | ..... | ..... | 4.16 |
| Thompson | 53 | — 1 | 31.0 | ..... |
| Uncasville | ..... | ..... | ..... | 5.72 |
| Voluntown* | 62 | 4 | 34.4 | 4.85 |
| Wallingford | ..... | ..... | ..... | 5.05 |
| Waterbury | 60 | 0 | 33.2 | 5.08 |
| West Simsbury | ..... | ..... | ..... | 3.42 |
| *Delaware.* | | | | |
| Dover | 62 | 16 | 38.3 | 9.92 |
| Kirkwood | 64 | 16 | 38.3 | ..... |
| *District of Columbia.* | | | | |
| Kendall Green | 56 | 16 | 38.3 | 8.38 |
| Washington B'ks | 60 | 17 | 40.0 | 9.20 |
| *Florida.* | | | | |
| Alva † | 91 | 47 | 66.8 | 0.50 |
| Archer | 88 | 36 | 62.8 | 4.85 |
| De Land † | 86 | 42 | 64.2 | ..... |
| Duke | 89 | 40 | 60.6 | 1.97 |
| Eustis * | 88 | 40 | 65.0 | 5.76 |
| Fort Barrancas | 85 | 37 | 61.8 | 10.19 |
| Fort Meade* | ..... | 41 | ..... | 3.24 |
| Hypoluxo * | 86 | 57 | 71.6 | 1.70 |
| Lake City | 84 | 39 | 62.2 | 4.25 |
| Merritt's Island † | 84 | 50 | 68.4 | 3.42 |
| Ocala | 84f | 44g | 63.4h | 2.79 |
| Orange City | 89 | 41 | 63.1d | 3.44 |
| St. Francis B'ks | 82 | 40 | 61.6 | 3.00 |
| San Antonio * | 86 | 43 | 65.1 | 3.07 |
| Tallahassee | 81 | 34 | 61.1 | 6.12 |
| Tarpon Springs | 86 | 45 | 66.2 | 2.76 |
| *Georgia.* | | | | |
| Athens (1) | 71 | 25 | 47.3 | 11.53 |
| Athens (2) † | 70 | 23 | 46.3 | 12.28 |
| Blakely | 78h | 37h | 59.9h | 8.58 |
| Butler * † | 68 | 34 | 49.0 | 8.70 |
| Diamond | 64 | 28 | 45.3 | 14.85 |
| Elberton † | ..... | ..... | ..... | 9.79 |
| Forsyth * | 80 | 29 | 53.7 | 12.49 |
| Fort McPherson | 73 | 23 | 47.0 | 10.16 |
| Gillsville | 75 | 28 | 47.6 | 10.55 |
| Hephzibah | 70 | 34 | 54.1 | 8.21 |
| Louisville | 82 | 28 | 53.0 | 4.70 |
| Marietta † | 71 | 22 | 46.1 | 10.32 |
| Milledgeville* † | 74 | 29 | 51.8 | 12.68 |
| Monticello | ..... | 33 | 48.2 | 13.64 |
| Point Peter* | ..... | 24 | 44.4 | 11.30 |
| Poulan | 81 | 30 | 56.4 | 4.89 |
| Quitman (1) | 79 | 35 | 60.3 | 5.65 |
| Rome † | ..... | ..... | ..... | 8.01 |
| *Idaho.* | | | | |
| American Falls † | 55 | — 3 | 31.8 | 1.00 |
| Boisé Barracks | 56 | 14 | 37.4 | 1.83 |
| Bonanza | 49 | —17 | 22.6 | 0.80 |
| Era † | 48 | — 6 | 25.0 | 0.54 |
| Fort Sherman | 56 | —12 | 33.4 | 2.90 |
| Garden Valley | 51 | — 6 | 23.6 | 2.63 |
| Henry's Lake | 53 | —25 | 19.6 | 1.40 |
| Kootenai | 52 | —12 | 31.4 | 0.12 |
| Mullan* | 52 | —10 | 27.8 | 1.90 |
| Payette † | 65 | —12 | 39.8 | 1.55 |
| Ruthburg | 60 | 12 | 37.3 | 1.06 |
| *Illinois.* | | | | |
| Alton | ..... | ..... | ..... | 2.49 |
| Aurora (1) † | 56 | — 6 | 28.6 | 2.57 |
| Aurora (2) | 60 | — 2 | 30.5 | 3.81 |
| Beardstown† | ..... | ..... | ..... | 5.19 |
| Beason | 61 | 2 | 33.0 | 3.20 |
| Belvidere | 55 | 0 | 29.1 | 2.49 |
| Carlinville * | 68 | 8 | 37.2 | 2.39 |
| Centralia | 68 | 8 | 35.0 | 2.24 |
| Charleston | 68 | 5 | 35.0 | 3.97 |
| Collinsville | 67 | 9 | 38.0 | 2.24 |
| Cockrell | 58 | — 2 | 28.6 | 3.04 |
| East Peoria | 66 | 7 | 34.6 | 3.60 |
| Flora | 70 | 8 | 39.0 | 3.75 |
| Fort Sheridan | 56 | — 1 | 29.6 | 2.56 |
| Golconda* † | 68 | 16 | 40.7 | 6.62 |
| Greenville | 65 | 6 | 36.0 | 3.16 |
| Griggsville * | 66 | 0 | 32.5 | 2.25 |
| Hennepin | 64 | — 4 | 29.2 | 3.13 |
| Irishtown | ..... | ..... | ..... | 2.57 |
| Jordan's Grove | 65 | 10 | 37.7 | 2.00 |
| Lacon * | 63 | 3 | 31.3 | 3.34 |
| Lanark | 50 | — 1 | 28.5 | 2.86 |
| Louisville | 66 | 10 | 36.1 | 3.25 |
| Martinsville | 66 | 10 | 38.6 | 3.93 |
| Mascoutah | 64 | 8 | 37.8 | 3.07 |
| Mattoon | 69 | 11 | 38.9 | 4.70 |
| McLeansborough | 64 | 14 | 39.1 | 2.08 |
| Mount Carmel † | ..... | ..... | ..... | 4.70 |
| Olney (1)* | 66 | 9 | 39.6 | 4.23 |
| Olney (2) | 67 | 10 | 37.8 | 4.33 |
| Oswego * | 58 | 0 | 29.6 | 2.33 |
| Ottawa† | 63 | — 1 | 33.0 | 2.56 |
| Palestine | 68 | 11 | 37.0 | 4.15 |
| Pana | 69 | 10 | 38.9 | 4.32 |
| Peoria (1)† | ..... | ..... | ..... | 3.05 |
| Peoria (2) | 64 | 7 | 34.3 | 2.68 |
| Philo | 68 | 1 | 33.9 | 4.32 |
| Pontiac | 60 | 0 | 31.9 | 2.88 |
| Riley * | 52 | 2 | 28.0 | 1.64 |
| Rockford | 56 | 0 | 27.7 | 3.21 |
| Rock Island Ars'l | 61 | 0 | 29.8 | 2.53 |
| Rushville | 66 | 2 | 32.4 | 3.49 |
| Sandwich | 57 | — 2 | 30.9 | 3.80 |
| South Evanston | 58 | 3 | ..... | 1.71 |
| Sycamore* | 58 | 1 | 29.1 | 1.95 |
| Warsaw | ..... | ..... | ..... | 2.73 |
| White Hall* | 66 | 6 | 35.2 | 1.88 |
| Winnebago | 53 | 0 | 28.2 | 4.25 |
| *Indiana.* | | | | |
| Angola | 57 | 1 | 33.2 | 3.34 |
| Butlerville * | 62 | 9 | 35.9 | 6.03 |
| Columbia City | 60 | 0 | 31.7 | 3.07 |
| Columbus | 52 | 11 | 34.3 | 6.21 |
| Connersville | 67 | 1 | 35.3 | 4.56 |
| Crandall | 67 | 14 | 39.0 | ..... |
| De Gonia Springs | 65 | 12 | 41.3 | 7.08 |
| Delphi | 61 | — 5 | 30.8 | 3.88 |
| Farmland | 64 | — 2 | 35.0 | 4.60 |
| Franklin | 66 | 7 | 36.5 | 6.63 |
| Huntingburgh | 72 | 20 | 43.0 | 6.65 |
| Huntington† | ..... | ..... | ..... | 1.92 |
| Jeffersonville | 67 | 17 | 40.9 | 6.63 |
| La Fayette | 65 | — 4 | 33.3 | 4.22 |
| Logansport (1) | ..... | ..... | ..... | 3.94 |
| Logansport (2) | 64 | 0 | 33.7 | 3.51 |
| Marengo | 69 | 9 | 42.1 | 8.50 |
| Marion g† | 66 | 6 | 38.5 | ..... |
| Mauzy * | 63 | — 2 | 31.6 | 5.85 |
| Michigan City | 64 | 1 | 33.1 | ..... |
| Mount Vernon (1)† | ..... | ..... | ..... | 5.51 |
| Mount Vernon (2) | ..... | ..... | ..... | 5.51 |
| Muncie | 64 | 10 | 37.7 | 3.22 |
| Princeton | 67 | 14 | 39.6 | 4.92 |
| Rockville | 69 | 5 | 36.3 | 4.74 |
| Rushville † | ..... | ..... | ..... | 5.45 |
| Seymour | 68 | 11 | 39.0 | 6.50 |
| Shelbyville | 57 | 9 | 37.8 | 4.39 |
| Valparaiso | 57 | 7 | 30.4 | 1.97 |
| Vevay | 70 | 7 | 40.1 | 7.71 |
| Vincennes | .... | ..... | ..... | 4.87 |
| Worthington | 60 | 4 | 37.8 | 5.52 |
| *Indian Territory.* | | | | |
| Eufaula | ..... | ..... | ..... | 1.40 |
| Fort Supply | 72 | 3 | 41.1 | 2.89 |
| Healdton | 74 | 28 | 49.9 | 3.18 |
| Tulsa† | ..... | ..... | ..... | 2.05 |
| Woodward | ..... | ..... | ..... | 3.66 |
| Wynne Wood | 73 | 17 | 42.6 | 2.45 |
| *Iowa.* | | | | |
| Alta (1)* | 50 | —10 | 24.2 | 1.77 |
| Alta (2) | 52 | —10 | 24.8 | 1.76 |
| Amana† | 50 | — 4 | 26.9 | 3.25 |
| Ames | 57 | — 6 | 27.7 | 2.55 |
| Atlantic | 62 | — 8 | 27.4 | 1.61 |
| Bancroft | 43 | —13 | 23.2 | 1.66 |
| Bedford † | ..... | ..... | ..... | 1.159 |
| Belle Plaine* | 56 | — 2 | 28.0 | 3.95 |
| Carroll† | 54 | —12 | 24.8 | 4.11 |
| Cedar Falls † | 50 | — 3 | 25.6 | 3.01 |
| Cedar Rapids † | 53 | — 1 | 28.2 | 3.64 |
| Charles City | 50 | — 6 | 27.4 | 1.86 |
| Clarinda * | 61 | — 3 | 29.4 | 1.89 |
| Clinton | 58 | — 2 | 28.1 | 2.99 |
| Cresco | 47 | — 7 | 23.3 | 1.68 |
| Dallas Centre* | ..... | —10 | 25.1 | 2.90 |
| Denison | ..... | ..... | ..... | 3.74 |
| Des Moines | 60 | — 9 | 28.7 | 3.25 |
| Eagle Grove | ..... | — 9 | 22.4 | 1.90 |
| Fairfield † | ..... | ..... | ..... | 4.58 |
| Fayette | 50 | — 8 | 25.3 | 3.38 |
| Fort Madison* | 62 | 3 | 34.4 | 2.25 |
| Glenwood (1) | 66 | — 8 | 29.8 | 1.44 |
| Greenfield | 59 | — 8 | 27.3 | 2.83 |
| Grinnell † | 52 | — 4 | 26.0 | 2.29 |
| Hampton | 49 | — 6 | 22.9 | 3.76 |
| Hopeville | 60 | — 4 | 29.0 | 2.50 |
| Humboldt * | 51 | —10 | 24.8 | 2.64 |
| Independence * | 48 | — 4 | 27.2 | 2.30 |
| Indianola | 59 | —10 | 28.4 | 1.42 |
| Iowa City | 52 | — 3 | 28.3 | 4.41 |
| Larrabee | 46 | —19 | 23.8 | 1.54 |
| Le Claire † | ..... | ..... | ..... | 2.30 |
| Logan† | 60 | — 7 | 29.9 | 2.33 |
| Manson* | 46 | — 8 | 24.9 | 2.44 |
| Maquoketa * | 52 | — 4 | 27.9 | 2.67 |
| Marshalltown | 56 | — 7 | 26.9 | 3.35 |
| Maxon *o | 60 | —20 | 35.5 | 1.68 |
| Monticello * | 50 | — 5 | 27.0 | 2.55 |
| Mount Pleasant*† | 54 | 3 | 30.2 | 1.32 |
| Mount Vernon* | 50 | — 3 | 29.5 | ..... |
| Muscatine (2) | 57 | — 2 | 29.0 | 3.50 |
| Osage * | ..... | — 6 | 23.2 | 1.47 |
| Oskaloosa (1) * | 58 | — 5 | 29.9 | 1.84 |
| Panama | 60 | — 9 | 27.6 | 1.46 |
| Stilson | 50 | — 9 | 22.8 | 1.40 |
| Storm Lake* | 46 | —10 | 23.9 | 1.33 |
| Tipton * | 52 | 1 | 29.8 | 4.15 |
| Vinton * | 47 | — 3 | 26.2 | 3.26 |
| Washington * | 56 | 0 | 32.2 | 3.45 |
| Webster City * | 56 | — 6 | 25.1 | 3.30 |

*Meteorological record of voluntary observers, &c.*—Continued.

| Stations. | Temperature. (Fahrenheit.) Max. | Min. | Mean | Precip'n. |
|---|---|---|---|---|
| *Iowa*—Cont'd. | ° | ° | ° | *Ins.* |
| West Bend*† | 51 | —11 | 23.3 | 2.82 |
| Williams*† | ..... | —14 | 22.0 | 2.46 |
| *Kansas.* | | | | |
| Abilene | 68 | 0 | 33.8 | 5.55 |
| Allison* | 70 | — 3 | 29.0 | 4.92 |
| Alton | 69 | — 1 | 32.6 | 6.50 |
| Altoona | ..... | ..... | ..... | 1.75 |
| Bucklin | ..... | ..... | ..... | 3.50 |
| Buffalo Park | 69 | 6 | ..... | 2.15 |
| Burr Oak | 68 | — 4 | ..... | 1.45 |
| Cawker City | 72 | 2 | 33.8 | 4.00 |
| Coldwater | ..... | ..... | ..... | 4.35 |
| Collyer | ..... | 2 | ..... | 3.35 |
| Columbus | ..... | ..... | ..... | 1.70 |
| Concordia | 66 | — 8 | 31.4 | 3.80 |
| Cunningham* | 69 | 6 | 33.1 | 3.57 |
| Downs | ..... | ..... | ..... | 5.12 |
| Elco | 72 | 1 | 36.9 | 3.35 |
| Elk Falls† | 74 | 12 | 41.0 | 2.10 |
| Ellis | 72 | 4 | 33.3 | 1.79 |
| Emporia | 65 | 5 | 36.0 | 2.51 |
| Englewood* | 70 | 2 | 37.6 | 2.76 |
| Eureka Ranch | 72 | 0 | 34.1 | 1.65 |
| Ft. Leavenworth(1) | 67 | 0 | 35.3 | 1.99 |
| Ft. Leavenworth(2) | 63 | 1 | 32.9 | 2.50 |
| Fort Riley | 66 | — 1 | 31.0 | 2.50 |
| Fremont | 74 | — 5 | 31.2 | 3.23 |
| Globe* | 67 | 2 | 31.8 | 3.40 |
| Gove City*† | 72 | 1 | 32.2 | 1.85 |
| Grainfield | 68 | 2 | 33.0 | 3.92 |
| Grenola | 77 | 8 | 39.0 | 2.20 |
| Grinnell | 70 | 2 | 35.3 | 1.80 |
| Halstead | 64 | 3 | 35.2 | 3.76 |
| Havensville* | ..... | ..... | ..... | 5.10 |
| Horton | 66 | — 1 | 34.4 | 1.63 |
| Hoxie | 68 | 0 | 30.1 | 1.90 |
| Hutchinson | ..... | ..... | ..... | 3.57 |
| Independence | 78 | 8 | 40.4 | 1.51 |
| Kansas City | 66 | 3 | 34.2 | 3.53 |
| Kellogg | ..... | ..... | ..... | 2.85 |
| Kingman | ..... | ..... | ..... | 4.37 |
| Kirwin† | ..... | ..... | ..... | 2.95 |
| La Crosse | 68 | 3 | 33.8 | 3.04 |
| La Harpe* | ..... | 10 | 30.0 | 2.57 |
| Lakin | 70 | — 4 | 32.7 | 1.90 |
| Lawrence | 71 | 3 | 35.1 | 3.04 |
| Lebo | 74 | 2 | 35.7 | 3.63 |
| Leoti | 70 | — 1 | 33.4 | 2.00 |
| Macksville* | 70 | 5 | 36.0 | 2.30 |
| Manhattan(1)† | ..... | ..... | ..... | 3.45 |
| Manhattan(2) | 69 | — 4 | 33.4 | 2.24 |
| Manhattan(3)* | 66 | 0 | 33.4 | 3.10 |
| Mankato | 68 | — 6 | 31.8 | 1.20 |
| Marmaton | 72 | 6 | 38.0 | 3.10 |
| McAllaster | 74 | 0 | 33.8 | 3.40 |
| McPherson | ..... | ..... | ..... | 3.57 |
| Minneapolis | 64 | — 2 | 32.9 | 3.42 |
| Monument | 70 | — 3 | 31.0 | 2.84 |
| Morse | 64 | 2 | 32.0 | 3.42 |
| Oakley | 72 | — 4 | ..... | ..... |
| Oberlin† | ..... | ..... | ..... | 7.28 |
| Ogallah | 65 | 3 | ..... | 1.28 |
| Oswego | 77 | 10 | 41.7 | 1.90 |
| Page City | 69 | 0 | 31.2 | 1.00 |
| Pauline | 72 | 0 | 35.6 | 2.20 |
| Pleasant Dale | 65 | 2 | 34.1 | 3.87 |
| Quinter | 67 | 0 | ..... | 1.40 |
| Rome | 73 | 10 | 39.5 | 3.01 |
| Salina* | 66 | 5 | 34.3 | 2.31 |
| Scott City | 70 | 4 | 37.0 | 1.25 |
| Sedan* | 76 | 7 | 39.2 | 1.76 |
| Seneca | 61 | — 7 | 30.5 | 3.12 |
| Sharon Springs | 75 | 0 | ..... | 2.25 |
| Shields | 78 | 3 | 37.5 | 3.36 |
| Spearville | 72 | 3 | 33.6 | 1.50 |
| Springvale | 72 | 10 | 38.8 | 6.00 |
| Stafford* | 67 | 13 | 44.6 | 3.67 |
| Tribune† | 69 | — 2 | 32.6 | 2.57 |
| Wakefield* | 67 | 2 | 34.9 | 4.75 |
| Wa Keeney | 68 | 0 | 32.4 | 1.91 |
| Wallace(1) | ..... | ..... | ..... | 1.06 |
| Wallace(2) | 72 | 1 | 34.9 | 1.90 |
| Wellington | 75 | 10 | 38.2 | 3.86 |
| Weskan | 70 | 2 | 32.3 | 1.20 |
| Yates Centre | ..... | ..... | ..... | 2.84 |
| *Kentucky.* | | | | |
| Bowling Green† | 70 | 19 | 44.2 | 8.24 |
| Burkesville | ..... | ..... | ..... | 9.11 |
| Burnside† | ..... | ..... | ..... | 9.49 |
| Caddo*† | 67 | 10 | 37.0 | 8.15 |
| Catlettsburgh† | ..... | ..... | ..... | 5.90 |
| Canton* | 67 | 20 | 44.4 | 9.10 |
| Central City | ..... | 12 | ..... | 7.54 |
| Earlington | 70 | 20 | 45.2 | 6.89 |
| Edmonton | 66 | 18 | 42.6 | 9.46 |
| Falmouth(1)† | ..... | ..... | ..... | 5.60 |
| Fort Thomas | 67 | 10 | 36.3 | 5.33 |
| Frankfort(1)† | ..... | ..... | ..... | 7.57 |
| Frankfort(2) | 71 | 13 | 40.8 | 7.57 |
| Franklin*† | 70 | 22 | 44.6 | 9.75 |
| Greensburgh† | ..... | ..... | ..... | 8.83 |
| Harrodsburgh† | 71 | 14 | 40.6 | 8.45 |
| Louisa† | ..... | ..... | ..... | 6.27 |
| Middlesborough† | 69 | 21 | 43.7 | 8.55 |
| Mount Sterling† | 68 | 16 | 39.8 | 7.07 |

| Stations. | Temperature. (Fahrenheit.) Max. | Min. | Mean | Precip'n. |
|---|---|---|---|---|
| *Kentucky*—Cont'd. | ° | ° | ° | *Ins.* |
| Newport Barracks | 68 | 10 | 37.3 | 5.58 |
| Paducah† | ..... | ..... | ..... | 8.10 |
| Pellville† | 69 | 13 | 39.5 | 9.02 |
| Princeton† | 66 | 9 | 41.2 | 7.65 |
| Richmond | 71 | 15 | 41.2 | 8.75 |
| Shelbyville† | 70 | 11 | 39.5 | 7.11 |
| Williamsburgh | ..... | ..... | ..... | 6.74 |
| *Louisiana.* | | | | |
| Abbeville | 78 | 32 | 59.0 | 2.14 |
| Alexandria† | ..... | ..... | ..... | 2.73 |
| Amité City | 82 | 35 | 59.8 | 4.34 |
| Baton Rouge | 82 | 36 | 59.3 | 3.23 |
| Cameron† | 83 | 32 | 61.2 | 2.63 |
| Cheneyville | 83 | 30 | 56.6 | 4.17 |
| Coushatta(1)† | ..... | ..... | ..... | 3.51 |
| Davis | 81 | 29 | 54.2 | 5.26 |
| Delhi† | ..... | ..... | ..... | 3.83 |
| Edgard | 81 | 40 | 60.2 | 3.63 |
| Emilie | 79 | 37 | 59.6 | 3.52 |
| Girard | ..... | ..... | ..... | 0.32 |
| Grand Cane | 78 | 27 | 55.1 | 3.70 |
| Grand Coteau | 79 | 34 | 59.6 | 0.80 |
| Homer | 76 | 30 | 52.3 | 4.59 |
| Houma | 84 | 33 | 57.1 | 4.54 |
| Jackson Barracks | 82 | 39 | 61.4 | 4.31 |
| Jeanerette | 80 | 36 | 59.4 | 4.35 |
| Lafayette | 83 | 33 | 60.0 | 2.06 |
| Lake Charles | 82 | 30 | 56.1 | 2.65 |
| Lawrence | ..... | ..... | ..... | 4.71a |
| Liberty Hill | 81 | 26 | 54.7 | 5.57 |
| Luling | 80 | 39 | 58.0 | 4.69 |
| Mandeville | 82 | 33 | 58.6 | 4.38 |
| Marksville | 80 | 28 | 54.9 | 2.59 |
| Maurepas | 78 | 37 | 58.6 | 3.76 |
| Melville† | 81 | 35 | 59.0 | 1.89 |
| Monroe† | 78 | 30 | 54.4 | 3.64 |
| New Iberia | 80 | 36 | 61.1 | 2.30 |
| Paincourtville | 81 | 37 | 60.0 | 3.68 |
| Shell Beach | 77 | 35 | 58.2 | 1.85 |
| Sugar Ex. Station | 78 | 38 | 59.0 | 3.27 |
| Thibodeaux | ..... | ..... | ..... | 3.19 |
| West End | ..... | ..... | ..... | 4.30 |
| Winnsborough | ..... | ..... | ..... | 8.15 |
| *Maine.* | | | | |
| Bar Harbor | 52 | 2 | 30.2 | 5.18 |
| Belfast* | 50 | 3 | 29.6 | ..... |
| Calais | 50 | 1 | 29.7 | 4.39 |
| Cornish | 52 | — 3 | 29.0 | 6.79 |
| Fairfield | 51 | —13 | 28.2 | 4.75 |
| Farmington* | 64 | — 7 | 29.4 | 8.28 |
| Fort Preble | 51 | 3 | 31.9 | 4.60 |
| Kennebec Arsenal | 42 | —10 | 20.8 | 4.94 |
| Kent's Hill | 49 | — 2 | 27.0 | 5.37 |
| Lewiston | 54 | — 4 | 28.3 | 7.03 |
| Mayfield | 45 | —10 | 22.0 | ..... |
| Orono† | 53 | — 5 | 26.9 | 5.20 |
| Petit Menan* | 45 | 15 | 30.3 | ..... |
| West Jonesport | 55 | 4 | 31.0 | ..... |
| *Maryland.* | | | | |
| Barren Creek Sp'gs† | 65 | 18 | 39.2 | 7.54 |
| Cumberland(1) | 58 | 12 | 35.9 | 7.47 |
| Cumberland(2) | 63 | 14 | 40.0 | 7.10 |
| Fallston* | 57 | 11 | 36.2 | 7.47 |
| Fort McHenry | 60 | 14 | 37.8 | 6.64 |
| Frederick | 59 | 14 | 38.2 | 6.31 |
| Gaithersburgh* | ..... | 19 | 33.9 | ..... |
| McDonogh | 56 | 12 | 35.8 | 6.66 |
| Mt. St. Mary's Col. | 58 | 16 | 37.4 | 4.56 |
| Taneytown† | ..... | ..... | ..... | 6.29 |
| Woodstock | 56 | 14 | 37.0 | 7.65 |
| *Massachusetts.* | | | | |
| Amherst | 60 | — 1 | 35.9 | 3.14 |
| Amherst Ex Sta(1) | 56 | — 1 | 32.1 | 2.89 |
| Amherst Ex Sta(2) | 56 | — 1 | 33.7 | 2.99 |
| Andover | 54 | — 3 | 31.0 | 7.87 |
| Ashland | ..... | ..... | ..... | 6.32 |
| Blue Hill (sum't) | 51 | — 1 | 31.7 | 4.88 |
| Blue Hill (base) | 54 | 1 | 33.6 | 5.06 |
| Blue Hill (valley) | 54 | 1 | 33.2 | 4.85 |
| Boston | ..... | ..... | ..... | 5.35 |
| Cambridge(1) | 51 | 1 | 32.2 | 4.90 |
| Cambridge(2) | 52 | 1 | 32.8 | 5.74 |
| Chestnut Hill | 54 | 0 | 33.8 | 5.63 |
| Chicopee | ..... | ..... | ..... | 4.60 |
| Clinton | ..... | ..... | ..... | 5.20 |
| Concord | 55 | 1 | 31.4 | 5.70 |
| Cotuit | 50 | 8 | 33.6 | 3.66 |
| Deerfield | 56 | — 2 | 32.2 | ..... |
| Dudley* | 56 | — 3 | 31.0 | 5.32 |
| Fall River(1)* | 62 | 6 | 34.6 | 5.75 |
| Fiskdale | ..... | ..... | ..... | 2.86 |
| Fitchburg(1) | 50 | 1 | 30.2 | 5.17 |
| Fitchburg(2) | 53 | — 2 | 31.0 | 5.15 |
| Florida* | 50 | — 8 | 26.1 | 0.98 |
| Fort Warren | 52 | 5 | 33.6 | 4.21 |
| Framingham | 51 | 0 | 33.0 | 6.63 |
| Gilbertville | 58 | — 2 | 32.2 | 3.70 |
| Groton(1) | 54 | — 1 | 32.8 | 5.31 |
| Groton(2) | 58 | — 2 | 31.6 | ..... |
| Heath* | 56 | —12 | 28.1 | ..... |
| Kendall Green | 56 | 0 | 33.8 | 6.26 |
| Lake Cochituate | 60 | 0 | 32.7 | 5.49 |
| Lawrence | 59 | — 1 | 32.7 | 5.10 |
| Leicester | 50 | — 3 | 30.2 | 5.09 |
| Leominster | ..... | ..... | ..... | 5.57 |

*Meteorological record of voluntary observers, &c.*—Continued.

| Stations. | Temperature. (Fahrenheit.) Max. | Min. | Mean | Precip'n. |
|---|---|---|---|---|
| *Massachusetts*—Con. | ° | ° | ° | *Ins.* |
| Long Plain* | 60 | 3 | 33.9 | 7.34 |
| Lowell(1) | 56 | 2 | 32.2 | 6.00 |
| Lowell(2) | 54 | 0 | 31.6 | ..... |
| Lowell(3) | 56 | 0 | 32.8 | ..... |
| Ludlow(1) | 52 | — 7 | 30.2 | 2.99 |
| Ludlow(2) | 58 | — 1 | 35.4 | 3.65 |
| Lynn | 48 | 1 | 32.2 | 4.51 |
| Mansfield | 55 | 0 | 32.8 | 5.63 |
| Medford | ..... | ..... | ..... | 5.35 |
| Middleborough | 61 | 4 | 33.7 | 4.90 |
| Milton* | 53 | 3 | 33.5 | 4.58 |
| Monson | 57 | — 8 | 31.4 | 3.01 |
| Mount Nonotuck | ..... | ..... | ..... | 2.66 |
| Mystic Lake | ..... | ..... | ..... | 6.19 |
| Mystic Station | ..... | ..... | ..... | 5.68 |
| New Bedford(1) | 58 | 4 | 33.2 | 5.68 |
| New Bedford(2) | 60 | 4 | 35.0 | 5.61 |
| Newburyport(1) | 50 | 2 | 32.9 | 4.51 |
| Newburyport(2) | ..... | ..... | ..... | 5.05 |
| Northampton | 57 | 1 | 33.2 | 3.83 |
| North Billerica | 55 | 4 | 34.8 | 5.40 |
| Plymouth | 55 | 7 | 35.2 | 5.04 |
| Provincetown | 50 | 16 | 34.7 | 3.69 |
| Randolph | ..... | ..... | ..... | 5.50 |
| Roberts' Dam | ..... | ..... | ..... | 6.18 |
| Royalston* | 52 | 2 | 32.7 | 5.09 |
| Salem(2) | ..... | ..... | ..... | 4.92 |
| Somerset* | 62 | 4 | 35.8 | 5.53 |
| South Hingham | ..... | 1 | ..... | 5.78 |
| Springfield Armr'y | 54 | 1 | 33.1 | 3.60 |
| Taunton(1) | 60 | 5 | 35.0 | 5.56 |
| Taunton(2) | 60 | 5 | 35.5 | 5.19 |
| Taunton(3) | 60 | 4 | 35.1 | 5.93 |
| Taunton(4) | 60 | 2 | 33.7 | 4.99 |
| Wakefield | 59 | — 2 | 33.4 | 6.46 |
| Waltham | ..... | ..... | ..... | 5.96 |
| Westborough* | 58 | 0 | 34.1 | 5.89 |
| Winchester* | ..... | ..... | ..... | 5.95 |
| Worcester(2) | 57 | — 1 | 30.5 | 4.59 |
| *Michigan.* | | | | |
| Adrian† | 55 | 4 | 30.6 | 2.74 |
| Albion(1) | 54 | 4 | 31.3 | 2.78 |
| Alma† | 57 | — 9 | 27.9 | 3.69 |
| Ann Arbor | 53 | 2 | 30.1 | 2.57 |
| Arbela | ..... | ..... | ..... | 2.09 |
| Atlantic*† | 44 | —10 | 17.2 | 3.20 |
| Ball Mountain† | 52 | 0 | 27.9 | 2.26 |
| Bangor | 60 | 1 | 33.2 | 2.86 |
| Bear Lake† | 57 | 2 | 26.8 | 3.23 |
| Bellaire† | 58 | —16 | 21.2 | 5.81 |
| Bell Branch | 46 | 10 | 29.8 | 2.65 |
| Benton Harbor† | 61 | 0 | 33.9 | 2.81 |
| Berlin | 56 | — 2 | 28.3 | 1.64 |
| Berrien Springs(2) | ..... | ..... | ..... | 4.71 |
| Birch Run† | ..... | ..... | ..... | 2.45 |
| Birmingham | 53 | 5 | 30.8 | 2.93 |
| Bronson | 50 | — 2 | 27.4 | 2.40 |
| Buchanan† | 53 | 0 | 30.3 | 3.14 |
| Calumet† | 47 | — 4 | 20.0 | 1.77 |
| Cassopolis† | 54 | 2 | 32.0 | 3.06 |
| Caldwell† | 54 | —14 | 23.8 | 3.80 |
| Charlevoix† | 53 | — 4 | 25.0 | 2.25 |
| Cheboygan† | 50 | —17 | 21.6 | 4.36 |
| Chelsea† | 54 | 4 | 30.0 | 1.81 |
| Clinton† | 57 | 3 | 30.6 | 2.10 |
| Colon | 44 | 2 | 27.9 | 3.23 |
| Concord† | 54 | — 2 | 29.3 | 2.03 |
| Crystal Falls† | 54 | —23 | 17.0 | 2.27 |
| Deerfield† | 56 | 3 | 29.7 | 1.01 |
| Eden† | 53 | — 5 | 30.2 | 2.67 |
| Evart† | 56 | —18 | 25.3 | 2.39 |
| Fairview† | 50 | — 1 | 30.3 | 2.86 |
| Fitchburg† | 52 | 4 | 29.0 | 2.74 |
| Flint† | 54 | — 4 | 28.1 | 1.60 |
| Fort Brady | 54 | —12 | 21.4 | 1.56 |
| Fort Mackinac | 42 | — 9 | 19.6 | 2.44 |
| Fort Wayne | 55 | 6 | 30.7 | 2.39 |
| Fremont*† | 57 | 5 | 28.9 | 1.70 |
| Gaylord† | 52 | — 5 | 22.2 | 2.00 |
| Grape† | 55 | 4 | 32.1 | 3.44 |
| Grayling† | 48 | —26 | 22.8 | 4.50 |
| Hanover† | 53 | 2 | 30.4 | 1.71 |
| Harbor Springs† | 55 | —16 | 25.0 | 2.44 |
| Hart† | 56 | 2 | 32.4 | 2.20 |
| Hastings | 53 | — 4 | 30.0 | 2.71 |
| Hayes† | 55 | — 2 | 29.5 | 1.70 |
| Highland Station*† | 53 | — 2 | 27.8 | 2.38 |
| Hillman† | 52 | —24 | 26.3 | 2.32 |
| Hillsdale† | 55 | — 2 | 29.5 | 2.28 |
| Holt† | ..... | ..... | ..... | 1.36 |
| Howell† | 58 | — 8 | 28.4 | 2.70 |
| Hudson | 58 | — 5 | 28.7 | 2.99 |
| Ionia | 55 | 0 | 28.9 | 0.60 |
| Ivan† | 49 | —15 | 25.3 | 2.88 |
| Jackson | 60 | 3 | 33.0 | ..... |
| Jeddo† | 49 | 2 | 28.1 | 1.02 |
| Kalamazoo† | 57 | — 2 | 31.6 | 2.10 |
| Lansing | 55 | 1 | 29.7 | 2.48 |
| Madison† | 56 | 3 | 31.0 | 2.80 |
| Marshall† | 57 | — 3 | 30.0 | 3.08 |
| May† | 54 | 1 | 27.2 | 2.82 |
| Montague† | 56 | 2 | 28.6 | 1.05 |
| Mottville† | 59 | — 5 | 30.4 | 2.03 |
| Noble | 48 | 6 | 29.2 | 3.11 |
| North Aurelius | ..... | ..... | ..... | 2.49 |

| Stations. | Temperature. (Fahrenheit.) Max. | Min. | Mean | Precip'n. |
|---|---|---|---|---|
| *Michigan*—Cont'd. | ° | ° | ° | *Ins.* |
| North Marshall† | 54 | 4 | 26.8 | 4.19 |
| Northport† | 50 | 3 | 25.6 | 3.39 |
| Olivet† | 53 | — 3 | 28.1 | 2.02 |
| Otsego† | 58 | 2 | 29.7 | 2.56 |
| Ovid† | 52 | 3 | 28.2 | 2.76 |
| Parkville† | ..... | ..... | ..... | 2.89 |
| Paw Paw† | 60 | —10 | 30.6 | 1.74 |
| Pontiac† | 53 | 8 | 30.4 | 3.66 |
| Pulaski* | 44 | 4 | 29.2 | 1.89 |
| Rawsonville* | 60 | 6 | 32.0 | 1.70 |
| Rockland | 64 | —12 | 22.5 | 2.15 |
| Roscommon† | 52 | —27 | 23.5 | 5.41 |
| Saint Ignace† | 46 | —11 | 22.3 | 3.03 |
| Saint John's† | 57 | 4 | 29.1 | 2.38 |
| Sand Beach† | 51 | — 1 | 26.0 | 2.02 |
| Standish† | 49 | —12 | 26.4 | 1.82 |
| Stanton† | 54 | —11 | 26.3 | 4.38 |
| Stockbridge† | ..... | ..... | ..... | 1.72 |
| Thornville† | 54 | — 1 | 30.0 | 2.40 |
| Vandalia† | 55 | 0 | 31.0 | 3.84 |
| Vienna† | ..... | ..... | ..... | 2.50 |
| Washington† | 57 | 1 | 30.8 | 2.15 |
| Weldon Creek† | 51 | — 8 | 27.3 | ..... |
| West Branch† | 50 | —12 | 25.5 | ..... |
| White Pigeon | 55 | — 8 | 29.0 | 1.73 |
| Williamston† | 58 | 2 | 33.2 | 3.10 |
| Ypsilanti | 49 | 2 | 27.3 | 2.61 |
| *Minnesota.* | | | | |
| Alexandria† | ..... | ..... | ..... | 1.11 |
| Alma City† | 41 | —15 | 21.9 | 1.05 |
| Crookston | 58 | —27 | 15.1 | 0.49 |
| Faribault | 49 | —21 | 21.8 | 1.86 |
| Farmington | 46 | — 8 | 24.6 | 3.50 |
| Fergus Falls† | ..... | ..... | ..... | 1.40 |
| Fort Ripley† | ..... | ..... | ..... | 0.92 |
| Fort Snelling | 48 | —10 | 21.4 | 2.19 |
| Grand Meadow | 54 | —12 | 24.3 | 1.49 |
| Kinbrae* | 40 | —16 | 18.4 | ..... |
| L. Winnibigoshish | 52 | —20 | 18.9 | 1.10 |
| Leech Lake | 55 | —29 | 18.4 | 1.41 |
| LeSueur* | 44e | —11e | 23.2e | 1.37 |
| Mankato | 46 | — 8 | 24.9 | 2.10 |
| Minneapolis* | 47 | — 6 | 23.4 | 1.62 |
| Montevideo | 46 | —16 | 20.6 | 1.16 |
| Morris | 47 | —22 | 17.8 | 1.55 |
| Northfield | 43 | —13 | 23.0 | 1.22 |
| Ortonville† | ..... | ..... | ..... | 1.50 |
| Pine River | 50 | —36 | 16.6 | 1.49 |
| Pokegama Falls | 49 | —40 | 23.1 | 1.37 |
| Red Wing | 48 | — 9 | 24.8 | 2.04 |
| Redwood Falls† | ..... | ..... | ..... | 1.63 |
| Rolling Green | 39 | —13 | 20.2 | 1.70 |
| Saint Charles*† | 45 | — 5 | 24.4 | 1.65 |
| Sheldon* | ..... | — 5 | 24.8 | 1.50 |
| Tracy† | ..... | ..... | ..... | 1.70 |
| *Mississippi.* | | | | |
| Agricultural Col'ge | 76 | 29 | 53.2 | 9.84 |
| Batesville | 75 | 26 | 50.6 | 7.43 |
| Bay Saint Louis | 75d | 44d | 61.2d | 6.27 |
| Booneville d | 73 | 25 | 49.0 | 11.62 |
| Brookhaven† | 82 | 30 | 57.2 | 3.64 |
| Canton† | 76 | 32 | 55.0 | 9.69 |
| Columbus(1) | ..... | ..... | ..... | 12.57 |
| Fayette | 81 | 34 | 58.4 | 3.03 |
| Greenville | 79 | 31 | 53.8 | 4.43 |
| Holly Springs(1)* | 72 | 26 | 49.0 | 10.44 |
| Kosciusko† | 77 | 29 | 52.2 | 15.50 |
| Logtown† | 78 | 39 | 60.4 | 6.32 |
| Louisville† | 84 | 26 | 54.4 | 9.32 |
| Moss Point† | 80 | 39 | 60.2 | 6.20 |
| Pontotoc† | 76 | 26 | 50.1 | 9.96 |
| Ship Island | 77 | 42 | 61.8 | 5.56 |
| Summit | 89f | 32f | 57.9f | 1.46 |
| Vaiden | 82 | 26 | 53.4 | 11.94 |
| Washington† | 82 | 33 | 56.9 | 3.18 |
| Water Valley* | 78 | 28 | 51.5 | 9.29 |
| Waynesboro'(1)† | 78 | 31 | 53.2 | 5.00 |
| West Point | 80 | 31 | 52.6 | 66.70 |
| Yazoo City† | ..... | ..... | ..... | 9.66 |
| *Missouri.* | | | | |
| Adrian† | 68 | — 4 | 32.6 | 3.18 |
| Appleton City | 68 | 6 | 37.4 | 3.28 |
| Austin†* | 64 | 8 | 36.8 | 3.25 |
| Boonville | ..... | ..... | ..... | 4.46 |
| Brunswick | 66 | — 1 | 35.0 | 4.35 |
| California | 72 | 5 | 40.5 | 5.00 |
| Cape Girardeau | ..... | ..... | ..... | 3.65 |
| Carrollton | 64 | 4 | 33.2 | 4.89 |
| Carthage | 70 | 11 | 39.9 | 1.89 |
| Cassville | 71d | 11d | 40.2d | 1.00 |
| Centreville | ..... | ..... | ..... | 2.38 |
| Conception | 61 | — 4 | 31.0 | 3.64 |
| Concordia | 66 | ..... | ..... | 1.50 |
| Dadeville | 68 | 22 | 45.6 | 3.03 |
| Darksville | 64 | 4 | 38.4 | 2.44 |
| Eldon* | 70 | 10 | 37.0 | 3.21 |
| Excelsior Springs* | 61 | —11 | 32.2 | 4.40 |
| Fayette | 66 | 2 | 34.9 | 2.66 |
| Fox Creek | 64 | 6 | 38.3 | 1.88 |
| Glasgow | 67 | 2 | 34.7 | 2.81 |
| Gordonville* | 67 | 17 | 42.8 | 3.10 |
| Grand Pass | ..... | 4 | 31.3 | 2.64 |
| Harrisonville†* | 61 | 2 | 34.4 | 3.09 |
| Hermann* | 69 | 12 | 40.0 | 1.98 |
| Jefferson Barracks | 67 | 11 | 37.8 | 3.13 |

*Meteorological record of voluntary observers, &c.*—Continued.

| Stations. | Temperature. (Fahrenheit.) Max. | Min. | Mean | Precip'n. |
|---|---|---|---|---|
| *Missouri*—Cont'd. | ° | ° | ° | *Ins.* |
| Jefferson City | 72 | 3 | 38.7 | 2.07 |
| Jerome † | ..... | ..... | ..... | 1.85 |
| Kansas City | 66 | 2 | 34.9 | 3.86 |
| Lamonte(1)* | 65 | 6 | 35.4 | 3.72 |
| Lamonte(2)* | ..... | — 4 | ..... | 2.28 |
| Langdon | ..... | ..... | ..... | 1.41 |
| Lebanon * | 78 | 10 | 41.3 | 1.63 |
| Liberty | 64 | 2 | 33.1 | 3.34 |
| Louisiana Bridge † | ..... | ..... | ..... | 1.76 |
| Marshall(2) | 73 | — 5 | 34.2 | ..... |
| Mine La Motte | 69 | 12 | 40.2 | 2.09 |
| New Haven * | 70 | 8 | 37.9 | 1.10 |
| Oak Ridge * | 71*d* | 17 | 44.5 | 4.30 |
| Oregon(1) | 65 | — 3 | 32.1 | 2.99 |
| Pickering | ..... | — 3 | 25.6 | 2.80 |
| Platte River* | 62 | 0 | 33.6 | 3.02 |
| Princeton * | 59 | — 4 | 32.5 | 5.88 |
| Saint Charles (1) | ..... | ..... | ..... | 2.40 |
| Saint Charles (2) | 67 | 5 | 36.9 | 2.74 |
| Saint Joseph † | ..... | ..... | ..... | 2.93 |
| Saint Louis | 68 | 8 | 37.6 | 2.39 |
| Sarcoxie | 74 | 10 | 39.8 | 1.05 |
| Sedalia | 68 | 3 | 36.1 | 3.70 |
| Shelbina | ..... | ..... | ..... | 2.10 |
| Steelville * | 72 | 8 | 39.2 | 1.26 |
| Stellada | 68 | 2 | 37.8 | 1.73 |
| Warrensburgh | 68 | 6 | 35.8 | 2.97 |
| Warrenton | ..... | 10 | 36.2 | 2.10 |
| Wither's Mills* | 68 | 4 | 36.2 | 2.90 |
| *Montana.* | | | | |
| Blackfeet Agency | 52 | —26 | 24.4 | 0.56 |
| Camp Poplar River | 59 | —36 | 20.1 | 0.44 |
| Choteau | 53 | —26 | 24.0 | 1.00 |
| Fort Assinniboine | 60 | —32 | 22.0 | 0.70 |
| Fort Custer | 61 | —30 | 25.0 | 0.60 |
| Fort Keogh | 60 | —37 | 15.8 | 0.35 |
| Fort Missoula | 59 | —18 | 27.2 | 3.72 |
| Fort Shaw | 59 | —31 | 28.0 | 0.30 |
| Glendive † | 65 | —34 | 23.0 | 0.90 |
| Martinsdale | 50 | —34 | 21.7 | 1.63 |
| Virginia City | 51 | — 8 | 23.3 | 0.63 |
| *Nebraska.* | | | | |
| Alliance † | 60 | —24 | 23.6 | 1.36 |
| Ansley † | 74 | —11 | 28.3 | 1.87 |
| Arborville * | 48 | 2 | 31.0 | 1.77 |
| Ashland | 67 | —10 | 29.9 | 1.61 |
| Auburn (1) | 62 | — 6 | 33.2 | 2.32 |
| Auburn (2)* | 66 | — 2 | 32.8 | 2.16 |
| Bassett | 74 | —12 | 21.5 | 1.40 |
| Beaver City* | 72 | 0 | 32.8 | 2.00 |
| Burwell* | 52 | —14 | 25.1 | 0.71 |
| Creighton *† | 54 | —22 | 23.1 | ..... |
| Crete | 64 | — 6 | 28.6 | 2.37 |
| Culbertson | ..... | ..... | ..... | 2.59 |
| David City | 58 | —11 | 22.8 | 1.80 |
| De Soto * | 59 | — 9 | 28.4 | 1.53 |
| Ericson * | 62 | —10 | 25.1 | 1.30 |
| Fairbury * | 55 | ..... | ..... | 2.66 |
| Fairfield | 60 | — 4 | 30.2 | 2.07 |
| Fort Niobrara | 59 | —38 | 20.7 | 1.44 |
| Fort Omaha | 65 | — 2 | 31.3 | 1.42 |
| Fort Robinson | 58 | —19 | 24.8 | 1.75 |
| Fort Sidney | 55 | —11 | 26.4 | 1.17 |
| Franklin | 65 | — 5 | 31.4 | 1.06 |
| Fremont* | 55 | — 8 | 29.0 | 1.08 |
| Genoa † | 47 | —15 | 24.6 | 1.82 |
| Gering | 64 | —14 | 26.6 | 1.47 |
| Grand Island | ..... | —12 | 22.9 | 2.03 |
| Grant | ..... | ..... | ..... | 3.15 |
| Harvard | 56 | — 8 | 27.2 | 1.97 |
| Hastings | 60 | — 6 | ..... | ..... |
| Hay Springs | 58 | —21 | 21.6 | 2.76 |
| Hebron | 66 | — 4 | 31.0 | 3.20 |
| Holdrege | 59 | — 6 | 32.6 | ..... |
| Imperial | 60 | — 2 | 33.0 | 2.00 |
| Kimball | 66 | —13 | 28.6 | 0.88 |
| Lexington* | 68 | — 5 | 30.2 | 2.35 |
| Lincoln | 62 | — 0 | 28.9 | 2.91 |
| Long Pine | 62 | —20 | 22.4 | ..... |
| Marquette * | ..... | —10 | ..... | 1.96 |
| Minden | 62 | — 8 | 28.6 | 3.56 |
| Norfolk | 49 | —15 | 24.7 | ..... |
| North Loup * † | 54 | —16 | 25.6 | 1.45? |
| Oakdale | 51 | —23 | 22.6 | 1.37 |
| O'Neill | 60 | —16 | 24.5 | 2.10 |
| Ough | ..... | ..... | ..... | 1.20 |
| Palmer | 52 | —18 | 22.7 | 1.95 |
| Paxton | ..... | ..... | ..... | 3.30 |
| Plattsmouth | ..... | ..... | ..... | 4.46 |
| Ravenna | 60 | — 8 | 27.8 | 2.29 |
| Sargent | ..... | ..... | ..... | 2.67 |
| Seward* | 60 | — 4 | 32.4 | 0.89 |
| Superior | 75? | — 4 | 33.4 | 0.95 |
| Syracuse * | 62 | — 3 | 29.8 | 0.91 |
| Tecumseh | 62 | — 8 | 31.1 | 3.62 |
| Tekamah | 51 | —13 | 29.5 | 0.90 |
| Wallace * | 62 | — 3 | 27.9 | 0.47 |
| Weeping Water* | 62 | — 5 | 29.3 | 2.24 |
| West Hill | 51 | —15 | 23.3 | 1.82 |
| West Point | 50 | —20 | ..... | 0.75 |
| Whitman * | 60 | —14 | 22.6 | 0.80 |
| Wilcox | ..... | ..... | ..... | 1.08 |
| York | ..... | ..... | ..... | 0.73 |
| *Nevada.* | | | | |
| Austin | 56 | 7 | 33.1 | 2.01 |
| *Nevada*—Cont'd. | ° | ° | ° | *Ins.* |
| Battle Mountain * | 60 | 20 | 40.7 | 0.50 |
| Belmont | 57 | 10 | 32.3 | 0.92 |
| Beowawe * | 62 | 10 | 37.7 | 2.49 |
| Browns * | 72 | 26 | 46.2 | 0.32 |
| Candelaria | 62 | 18 | 39.4 | 0.09 |
| Carlin * | 54 | 6 | 32.7 | 2.10 |
| Carson City | 68 | 18 | 40.8 | 2.55 |
| Crane's Ranch | ..... | ..... | ..... | 2.07 |
| Downeyville | 68 | 15 | 42.6 | 0.59 |
| Elko (1)* | 60 | 10 | 36.9 | 2.43 |
| Ely | 51 | 4 | 29.0 | 1.30 |
| Eureka | 56 | 2 | 34.4 | 2.73 |
| Fenelon * | 55 | 20 | 35.2 | 1.10 |
| Genoa | 68 | 17 | 40.8 | 2.95 |
| Golconda * | 68 | 22 | 39.7 | 0.85 |
| Halleck * | 58 | — 8 | 32.3 | 1.00 |
| Hawthorne (1) | 69 | 24 | 44.0 | 0.16 |
| Hawthorne (2) | 70 | 21 | 43.8 | 0.25 |
| Hot Springs * | 70 | 11 | 44.2 | 1.00 |
| Humboldt * | 58 | 20 | 41.1 | 1.15 |
| Lewer's Ranch | 63 | 15 | 39.7 | 4.65 |
| Mill City | 68 | 18 | 44.4 | T. |
| Palisade * | 60 | 12 | 34.3 | 3.00 |
| Palmetto | 64 | 9 | 36.8 | 1.83 |
| Pioche | 70 | 5 | 36.2 | 0.31 |
| Reno * | 65 | 18 | 42.0 | 2.20 |
| Reno State Univ'ty | 64 | 13 | 39.8 | 2.28 |
| Tecoma * | 52 | 17 | 33.7 | 0.83 |
| Toano * | 60 | 18 | 34.6 | 2.20 |
| Virginia City | 57 | 14 | 37.3 | 2.31 |
| Wadsworth * | 68 | 16 | 42.2 | 1.37 |
| Wells * | 51 | 12 | 38.5 | 0.35 |
| Winnemucca * | 65 | 20 | 47.9 | 0.85 |
| Younts Ranch | 78 | 30 | 53.4 | 0.66 |
| *New Hampshire.* | | | | |
| Antrim | ..... | ..... | ..... | 2.88 |
| Belmont | ..... | ..... | ..... | 4.27 |
| Berlin Falls | 50 | —32 | 23.2 | ..... |
| Berlin Mills * | 49 | —20 | 24.0 | 4.91 |
| Concord | 52 | — 4 | 30.0 | 4.19 |
| East Canterbury | 48 | — 5 | 28.4 | 4.56 |
| Groveton * | 52 | — 6 | 25.9 | ..... |
| Hanover (1) | 52 | —14 | 28.6 | 2.32 |
| Hanover (2) | 53 | —19 | 28.2 | 2.02 |
| Lake Village | ..... | ..... | ..... | 4.36 |
| Littleton | 55 | —16 | 27.0 | 2.30 |
| Manchester (1) | 55 | — 1 | 30.8 | 4.30 |
| Mine Falls | ..... | ..... | ..... | 5.26 |
| Nashua * | 56 | 1 | 31.9 | 5.43 |
| Newton | 52 | 0 | 30.7 | 3.96 |
| North Conway | 51 | — 6 | 27.8 | 6.22 |
| Pennichuck Station | ..... | ..... | ..... | 4.78 |
| Plymouth | 56 | — 6 | 27.8 | 3.85 |
| Stratford | 60 | —15 | 28.8 | 2.04 |
| Walpole | 51 | —11 | 28.1 | 3.14 |
| West Milan | 58 | —18 | 25.1 | 3.70 |
| Wier's Bridge | ..... | ..... | ..... | 4.45 |
| Wolfborough | ..... | ..... | ..... | 4.16 |
| *New Jersey.* | | | | |
| Allaire | 55 | 11 | 36.1 | ..... |
| Asbury Park | 58 | 12 | 37.8 | 3.75 |
| Bellevillet | ..... | ..... | ..... | 5.90 |
| Beverly † | 64 | 11 | 36.8 | 5.87 |
| Billingsport L. H* | 55 | 13 | 37.0 | 6.26 |
| Bridgeton* | 65 | 17 | 40.2 | 8.02 |
| Camden | 62 | 15 | 38.6 | 6.22 |
| Cape May C. H. † | 61 | 13 | 38.8 | 6.39 |
| Deckerton | 58*j* | 4*j* | 32.2*j* | 4.35 |
| Dover | 63 | 4 | 35.5 | 4.04 |
| Egg Harbor City | 58 | 12 | 37.8 | 7.62 |
| Franklinville | 62 | 13 | 37.3 | 6.26 |
| Freehold | 59 | 17 | 38.1 | 4.63 |
| Gillette | 61 | 8 | 35.4 | 4.61 |
| Highland Park† | 61 | 8 | 36.3 | 4.89 |
| Imlaystown * | 61 | 12 | 37.0 | 4.33 |
| Junction City | ..... | ..... | ..... | 3.57 |
| Lambertville * | 59 | 12 | 36.4 | 3.69 |
| Locktown | 61 | 6 | 35.3 | 4.51 |
| Madison *d* | 56 | 7 | 34.8 | 3.71 |
| Moorestown * | 64 | 12 | 36.6 | 4.80 |
| Mount Holly | 63 | 14 | 38.6 | 4.96 |
| Newark (1) | 58 | 10 | 36.3 | 4.61 |
| Newark (2) | ..... | ..... | ..... | 5.94 |
| New Brunswick (1) | 63 | 6 | 36.4 | 5.83 |
| New Brunswick (2) | 62 | 10 | 36.4 | 4.78 |
| Newton | ..... | ..... | 34.5 | ..... |
| Ocean City* | 54 | 17 | 37.8 | 7.70 |
| Oceanic *h* | 58 | 13 | 37.2 | 4.92 |
| Paterson | 68 | 10 | 39.6 | 2.05 |
| Rancocas | ..... | 10 | ..... | 4.10 |
| Readington * | 62*e* | 12 | 40.0 | ..... |
| Salem | 65 | 15 | 38.0 | 7.30 |
| South Orange † | 65 | 8 | 35.4 | 4.81 |
| Tenafly * | 60 | 6 | 35.6 | 3.69 |
| Trenton * | 64 | 13 | 40.0 | 4.22 |
| Vineland | 64 | 13 | 39.0 | 7.05 |
| Woodbury | 64 | 15 | 39.0 | 6.77 |
| *New Mexico.* | | | | |
| Albert | 74 | 6 | 42.7 | 1.22 |
| Antelope Spring | 70 | 7 | 40.3 | 1.42 |
| Bernalillo | ..... | ..... | ..... | 1.60 |
| Cuba | ..... | ..... | ..... | 2.05 |
| Deming | 78 | 30 | 51.5 | 0.64 |
| Embudo | ..... | ..... | ..... | 1.65 |
| Estalina Springs | 67 | 10 | 38.3 | 0.90 |

*Meteorological record of voluntary observers, &c.*—Continued.

| Stations. | Temperature. (Fahrenheit.) Max. | Min. | Mean | Precip'n. |
|---|---|---|---|---|
| *N. Mexico*—Cont'd. | ° | ° | ° | *Ins.* |
| Fort Bayard | 74 | 17 | 44.2 | 0.36 |
| Fort Wingate | 64 | — 2 | 37.0 | 2.40 |
| Gallinas Spring † | 70 | 21 | 45.1 | 1.18 |
| Hillsborough † | 75 | 15 | 48.6 | 0.31 |
| Lordsburg | 78 | 25 | 49.9 | 0.65 |
| Los Lunas | 74 | 10 | 46.2 | 3.00 |
| Monero * | 55 | —12 | 26.8 | 2.45 |
| Nogal | ..... | ..... | ..... | 0.78 |
| Pojuaque | ..... | ..... | ..... | 0.79 |
| Red Cañon † | 71 | 15 | 44.8 | 0.65 |
| Springer | ..... | ..... | ..... | 0.45 |
| Taos | ..... | ..... | ..... | 1.01 |
| *New York.* | | | | |
| Adams Centre | ..... | ..... | ..... | 1.37 |
| Adelphi Academy | 65 | 11 | 37.8 | ..... |
| Addison | 56 | 0 | 32.5 | 2.12 |
| Afton | ..... | ..... | ..... | 2.44 |
| Akron | ..... | ..... | ..... | 2.19 |
| Alabama | 55 | — 5 | 27.6 | 2.13 |
| Alfred Centre | 58 | —10 | 28.8 | 2.54 |
| Apulia | ..... | ..... | ..... | 3.35 |
| Arcade (1) | 53 | — 9 | 27.3 | 1.87 |
| Arkwright | 51 | 6 | 29.8 | ..... |
| Au Sable Forks | ..... | ..... | ..... | 1.19 |
| Avon | ..... | ..... | ..... | 1.76 |
| Baldwinsville * | 54 | 0 | 30.2 | 5.91 |
| Bethlehem Centre | ..... | ..... | ..... | 2.93 |
| Binghamton | 63 | — 4 | 31.9 | 4.46 |
| Blood's Depot | ..... | ..... | ..... | 3.16 |
| Bolivar | ..... | ..... | ..... | 2.27 |
| Boyd's Corners * | 63 | 5 | 35.3 | 3.36 |
| Brentwood | 67 | 12 | 38.4 | 4.40 |
| Brookfield | 53 | —15 | 29.4 | 3.58 |
| Canton † | 62 | —11 | 27.6 | 2.61 |
| Carmel | 60 | 1 | 34.3 | 3.39 |
| Central Park, N. Y. | 58 | 9 | 35.8 | 3.61 |
| Chenango Forks | ..... | ..... | ..... | 1.75 |
| Cherry Creek | ..... | ..... | ..... | 3.25 |
| Constableville | 53 | —18 | 24.8 | 5.12 |
| Cooperstown | 52 | —12 | 28.8 | 2.60 |
| Davids Island | 60 | 8 | 36.6 | 2.57 |
| De Kalb Junction | ..... | ..... | ..... | 4.40 |
| Demster | ..... | ..... | ..... | 3.35 |
| Deposit | ..... | ..... | ..... | 2.69 |
| Dunkirk (1) | 59 | 6 | 32.4 | ..... |
| Dunkirk (2) | ..... | ..... | ..... | 1.49 |
| Easton | ..... | ..... | ..... | 2.12 |
| Elmyra | 55 | 2 | 33.7 | 1.98 |
| Factoryville | 59 | — 2 | 32.1 | 2.84 |
| Fleming * | 53 | 0 | 29.2 | 2.50 |
| Fort Columbus | 61 | 10 | 36.3 | 3.83 |
| Fort Hamilton | 61 | 10 | 38.0 | 3.20 |
| Fort Niagara | 54 | 11 | 30.8 | 2.13 |
| Fort Porter | 48 | 4 | 29.2 | 0.91 |
| Fort Schuyler | 57 | 7 | 33.4 | 2.66 |
| Fort Wadsworth | 64 | 10 | 38.0 | 4.49 |
| Galway | ..... | ..... | ..... | 4.10 |
| Geneva | 55 | 5 | 32.0 | 4.35 |
| Hammondsport * | 60 | 1 | 32.2 | 3.10 |
| Hess Road Station | 50 | 6 | 30.0 | 3.22 |
| Honeymead Brook * | 59 | 0 | 32.0 | 2.30 |
| Humphrey | 57 | — 1 | 30.0 | 2.36 |
| Italy Hill | 53 | 1 | 27.5 | ..... |
| Ithaca | 56 | — 2 | 32.5 | 3.30 |
| Jamestown | ..... | ..... | 31.0 | ..... |
| Keene Valley | 61 | —10 | 22.2 | 3.26 |
| Le Roy | 54 | — 1 | 30.5 | 7.40 |
| Liberty | ..... | ..... | ..... | 3.65 |
| Lowville | ..... | — 9 | 25.2 | 3.60 |
| Lyndonville | ..... | ..... | ..... | 2.54 |
| Lyon Mountain (1) | 51 | — 9 | 23.4 | ..... |
| Lyon Mountain (2) | ..... | ..... | ..... | 1.50 |
| Madison Barracks | 53 | —11 | 29.0 | 2.89 |
| Malone | 59 | — 8 | 26.5 | 3.31 |
| Marshland | 56 | — 5 | 32.2 | ..... |
| Middleburgh | 58 | — 8 | 31.5 | 3.61 |
| Middletown * | 61 | 4 | 31.0 | 3.37 |
| Minnewaska * | 52 | — 2 | 27.4 | 4.73 |
| Mount Morris | 60 | 1 | 33.5 | 1.90 |
| Newark Valley | ..... | ..... | ..... | 4.37 |
| New Lisbon * | 59 | —15 | 28.2 | 2.09 |
| North Hammond | ..... | ..... | 28.9 | 5.08 |
| Number Four | 55 | —17 | 26.1 | 3.52 |
| Ogdensburgh (1)* | 50 | —14 | 24.5 | ..... |
| Ogdensburgh (2)* | ..... | — 8 | 29.6 | ..... |
| Oxford † | 57 | — 8 | 30.2 | 2.78 |
| Palermo † | 60 | — 6 | 31.2 | 3.80 |
| Palmyra * | 56 | 6 | 31.9 | 5.30 |
| Pawling | ..... | ..... | ..... | 2.72 |
| Peekskill † | 59 | 4 | 32.7 | 4.65 |
| Perry City | 52 | — 9 | 28.9 | 3.45 |
| Plattsburgh | 57 | 0 | 28.7 | 1.90 |
| Plattsburgh B'ks | 55 | 0 | 29.0 | 2.65 |
| Port Jervis | 60 | 1 | 31.5 | 3.11 |
| Potsdam | 57 | — 8 | 26.0 | 3.78 |
| Poughkeepsie | 65 | 0 | 33.4 | 2.91 |
| Quaker Street † | 53 | — 6 | 26.3 | 3.23 |
| Rome | 55 | — 4 | 30.6 | 3.74 |
| Rondout | 59 | 5 | 32.9 | 5.18 |
| Saratoga | 63 | — 2 | 31.3 | ..... |
| Setauket | 57 | 12 | 35.0 | 3.84 |
| Sherman | 55 | — 3 | 29.4 | 3.56 |
| Schodack Depot | ..... | ..... | ..... | 2.64 |
| South Canisteo | 60 | —10 | 28.8 | 3.43 |
| S. E. Reservoir | ..... | ..... | ..... | 3.42 |
| *New York*—Cont'd. | ° | ° | ° | *Ins.* |
| South Kortright | 57 | —14 | 29.5 | 2.37 |
| Turin * | 48 | —12 | 23.9 | 4.18 |
| Utica | 55 | — 3 | 28.6 | 3.77 |
| Wappinger's Falls | ..... | ..... | ..... | 3.13 |
| Watertown | 62 | — 6 | 29.2 | 4.55 |
| Watervleit Arsenal | ..... | 2 | ..... | 2.15 |
| Watkins † | 66 | 3 | 35.1 | ..... |
| Wedgwood | 55 | — 3 | 28.0 | 3.11 |
| West Point | 55 | 9 | 29.2 | 2.83 |
| White Plains | 60 | 7 | 36.8 | 1.68 |
| Willets Point | 60 | 9 | 36.4 | 3.48 |
| *North Carolina.* | | | | |
| Asheville | 70 | 14 | 42.2 | 6.54 |
| Bryson City | ..... | ..... | ..... | 8.67 |
| Chapel Hill * | 70*k* | 21*f* | 44.7*e* | 7.75 |
| Currituck Inlet † | ..... | ..... | ..... | 7.75 |
| Douglas | 66 | 17 | 43.8 | 6.70 |
| Fayetteville | ..... | ..... | ..... | 7.84 |
| Franklin | 68 | 15 | 40.2 | 3.80? |
| Hendersonville | 69 | 22 | 42.5 | 11.67 |
| Lenoir * | 67 | 22 | 43.0 | 8.30 |
| Lillington † | ..... | ..... | ..... | 7.59 |
| Littleton † | 73*f* | 24 | 43.6 | 7.84 |
| Louisburgh † | 69 | 22 | 47.5 | 5.38 |
| Marshallberg † | 77 | 27 | 52.0 | 6.18 |
| Morganton * † | 67 | 22 | 42.5 | 8.59 |
| Mount Airy † | 67 | 18 | 41.1 | 6.51 |
| Mount Holly † | ..... | ..... | ..... | 10.41 |
| Mount Pleasant | 68 | 22 | 44.7 | 10.13 |
| Murphy | ..... | ..... | ..... | 10.41 |
| Oak Ridge † | 65 | 18 | 42.3 | 7.06 |
| Pittsborough | 65 | 23 | 42.3 | 7.00 |
| Salisbury | 66 | 24 | 45.2 | 9.21 |
| Smithfield | 73 | 24 | 46.2 | 7.80 |
| Soapstone Mount * | ..... | 22 | 40.9 | 10.50 |
| Southern Pines | 72 | 23 | 49.8 | 7.18 |
| Washington | 74 | 23 | 48.4 | 6.91 |
| Weldon † | 74 | 23 | 44.4 | 8.30 |
| Willeyton | 70 | 21 | 44.7 | 8.10 |
| *North Dakota.* | | | | |
| Ellendale | 54 | —21 | 18.4 | 2.48 |
| Fort A. Lincoln | 50 | —30 | 16.8 | 0.67 |
| Fort Buford | 57 | —30 | 19.0 | 0.27 |
| Fort Pembina | 48 | —24 | 9.7 | 1.09 |
| Fort Yates | 55 | —30 | 19.2 | 0.82 |
| Gallatin * † | 50 | —32 | ..... | 0.28 |
| Kelso † | 47 | —25 | 12.9 | 2.17 |
| Napoleon † | 42 | —20 | 13.5 | 1.11 |
| New England City † | 57 | —35 | 20.4 | 1.00 |
| Steele † | 50 | —32 | 15.6 | 1.52 |
| Wahpeton *† | 56 | —36 | 18.2 | 1.19 |
| Wild Rice *† | 49 | —24 | 11.7 | 1.25 |
| *Ohio.* | | | | |
| Akron | 59 | 7 | 33.0 | 3.47 |
| Ashland * | 56 | — 2 | 33.0 | 3.87 |
| Athens | 66 | 8 | 39.0 | 4.03 |
| Bangorville | 60 | 2 | 32.0 | 4.15 |
| Bellevue * | 50 | 0 | 30.4 | 3.01 |
| Bement * | 60 | 3 | 30.8 | 3.59 |
| Caledonia † | ..... | ..... | ..... | 3.56 |
| Canton † | 62 | 2 | 34.0 | 2.96 |
| Celina | 66 | 7 | 36.0 | 4.52 |
| Circleville (1) † | ..... | ..... | ..... | 4.94 |
| Clarksville | 64 | 7 | 36.0 | 5.21 |
| Cleveland | 60 | 11 | 33.5 | 3.27 |
| Columbus Barracks | 64 | 1 | 36.2 | 5.65 |
| Dayton † | 64 | 1 | 37.0 | 4.90 |
| Demos | 63 | 4 | 34.3 | 4.27 |
| Ellsworth | ..... | ..... | ..... | 3.00 |
| Elyria | 63 | 8 | 33.0 | 3.27 |
| Findlay | 61 | — 1 | 33.0 | 4.05 |
| Garrettsville | 61 | — 8 | 31.1 | 3.58 |
| Georgetown | 69 | 12 | 39.0 | 6.25 |
| Granville | 62 | 4 | 33.0 | 3.59 |
| Gratiot * | 63 | — 2 | 35.3 | 4.53 |
| Greenville * † | 60 | — 1 | 34.0 | 5.01 |
| Hanging Rock * | 70 | 12 | 39.0 | 5.75 |
| Hiram | 59 | 2 | 31.0 | 3.27 |
| Hudson | ..... | ..... | ..... | 4.10 |
| Jacksonborough | 66 | 9 | 35.9 | 5.60 |
| Kenton * † | 62 | — 1 | 32.8 | 4.65 |
| Leipsic | ..... | ..... | ..... | 4.14 |
| Logan | 68 | 1 | 37.0 | 5.09 |
| Lordstown | 62 | — 5 | 32.0 | 3.14 |
| Mansfield † | ..... | ..... | ..... | 3.69 |
| Marietta (1) | ..... | ..... | ..... | 4.68 |
| Marietta (2) | 67 | 10 | 40.0 | 4.73 |
| McConnelsville | 67 | 5 | 37.0 | 3.56 |
| Montpelier | 55 | — 4 | 30.0 | 3.63 |
| Napoleon † | 61 | 1 | 34.8 | 3.31 |
| New Alexandria | 61 | 2 | 35.0 | 3.77 |
| New Comerstown | 64 | 0 | 35.0 | 2.60 |
| North Lewisburgh | 62 | — 1 | 33.5 | 5.35 |
| Oberlin | 59 | 6 | 32.0 | 2.70 |
| O. S. University † | 63 | — 2 | 35.0 | 4.39 |
| Orangeville * | 60 | — 6 | 32.3 | 3.35 |
| Pomeroy | 67 | 11 | 41.0 | 2.69 |
| Portsmouth (1) | ..... | ..... | ..... | 5.54 |
| Portsmouth (2) † | 74 | 16 | 40.7 | 5.70 |
| Quaker City | ..... | ..... | ..... | 2.91 |
| Salineville | 61 | —10 | 34.6 | 3.90 |
| Sidney | ..... | ..... | ..... | 5.18 |
| Springborough † | ..... | ..... | ..... | 5.16 |
| Tiffin | 60 | 1 | 32.9 | 3.18 |
| Upper Sandusky | 59 | 2 | 34.0 | 3.05 |

*Meteorological record of voluntary observers, &c.*—Continued.

| Stations. | Temperature. (Fahrenheit.) Max. | Min. | Mean | Precip'n. |
|---|---|---|---|---|
| *Ohio*—Cont'd. | ° | ° | ° | *Ins.* |
| Wapakoneta | 62 | — 5 | 33.0 | 3.36 |
| Wauseon | 62 | — 4 | 30.8 | 4.45 |
| Waverly | 72 | 10 | 38.0 | 5.52 |
| Waynesville | ..... | ..... | ..... | 6.01 |
| Westerville | 62 | — 2 | 35.2 | 4.56 |
| West Milton* | 63 | 2 | 37.2 | 5.99 |
| Weymouth | 59 | — 8 | 32.0 | 2.47 |
| Wheeler | ..... | ..... | ..... | 2.33 |
| Wooster† | 61 | 0 | 32.0 | 3.71 |
| Youngstown | 63 | 5 | 35.0 | 3.84 |
| Zanesville† | ..... | ..... | ..... | 3.43 |
| *Oklahoma Ter.* | | | | |
| Buffalo | ..... | ..... | ..... | 2.05 |
| Fort Reno | 80 | 12 | 45.5 | 2.47 |
| Fort Sill | 86 | 16 | 45.6 | 2.66 |
| Guthrie* | 85 | 18 | 47.2 | 2.86 |
| *Oregon.* | | | | |
| Albany* | 64 | 9 | 42.8 | 3.41 |
| Ashland (1) | 60 | 28 | 43.4 | 1.88 |
| Ashland (2) | 65 | 23 | 45.0 | 2.54 |
| Bandon* | 63 | 34 | 48.7 | 5.78 |
| Cascade Locks | 62 | 23 | 45.2 | 6.52 |
| Corvallis | 61 | 13 | 42.4 | 2.48 |
| Deer Island | ..... | ..... | ..... | 2.40 |
| East Portland | 60 | 18 | ..... | 0.36 |
| Eola | 58 | 18 | 41.8 | 2.13 |
| Eugene | 64 | 19 | 44.2 | 2.78 |
| Forest Grove | 62 | 26 | 43.8 | 2.85 |
| Grant's Pass | 70 | 26 | 47.2 | 2.43 |
| Happy Valley | 59 | 14 | 35.6 | 2.35 |
| Hardman | 60 | 10 | 33.0 | 1.74 |
| Heppner† | 60 | — 6 | 36.6 | 2.06 |
| Hood River | ..... | ..... | ..... | 2.80 |
| Hubbard | 62 | 20 | 40.6 | 2.47 |
| Jacksonville | 61 | 27 | 47.1 | 2.13 |
| Joseph | 50 | — 8 | 26.9 | 2.15 |
| La Grande | 54 | 2 | 34.2 | 1.71 |
| Lakeview | 58 | 9 | 36.0 | 2.06 |
| Lone Rock | 56 | — 8 | 33.4 | 1.91 |
| McMinnville | 60 | 22 | 42.0 | 2.54 |
| Mount Angel | 62 | 21 | 43.9 | 3.23 |
| Pendleton | 61 | — 7 | 37.6 | 1.84 |
| Silver Lake | 59 | 11 | 35.6 | 0.77 |
| Siskiyou | 55 | 22 | 41.1 | 2.78 |
| Telocaset | ..... | ..... | ..... | 1.50 |
| The Dalles | 64 | — 1 | 39.4 | 0.53 |
| Tillamook R'k L.H. | ..... | ..... | ..... | 6.15 |
| Vernonia | 55 | 15 | 40.6 | 3.29 |
| Weston | 64 | 3 | 36.4 | 2.24 |
| *Pennsylvania.* | | | | |
| Allegheny Arsenal | 64 | 5 | 36.6 | 3.59 |
| Altoona | 60 | 13 | 39.9 | 2.64 |
| Aqueduct* | 58 | 11 | 35.9 | 5.07 |
| Blooming Grove* | 57 | — 3 | 33.0 | 5.10 |
| Blue Knob* | 56 | — 5 | 28.3 | 5.61 |
| Brookville† | ..... | ..... | ..... | 4.13 |
| Browers Lock | ..... | ..... | ..... | 6.65 |
| Carlisle | 58 | 10 | 33.8 | 6.52 |
| Charlesville | 57 | — 3 | 32.8 | 7.89 |
| Clarion (1)† | ..... | ..... | ..... | 4.04 |
| Coatesville† | 61 | 10 | 34.6 | 7.61 |
| Confluence† | ..... | ..... | ..... | 4.36 |
| Coopersburgh | 63 | 8 | 35.0 | 6.54 |
| Corry | 62 | —14 | 31.3 | 2.72 |
| Davis Island Dam† | ..... | ..... | ..... | 3.11 |
| Doylestown | ..... | ..... | ..... | 5.55 |
| Du Bois† | ..... | ..... | ..... | 3.08 |
| Dyberry† | 56 | —14 | 30.2 | 4.19 |
| Eagle's Mere | 48 | —12 | 29.1 | 5.88 |
| Easton | 61 | 6 | 34.6 | 5.02 |
| Edinborough* | 50 | 3 | 29.2 | ..... |
| Emporium | 62 | — 4 | 35.7 | 5.12 |
| F'ks of Neshaminy | ..... | ..... | 36.3 | 4.61 |
| Frankford Arsenal | 64[k] | 10[k] | 38.8[k] | 4.65 |
| Frederick | ..... | ..... | ..... | 6.09 |
| Freeport† | ..... | ..... | ..... | 4.26 |
| Girardville† | 53 | 7 | 33.1 | 3.80 |
| Grampian Hills | 58 | — 2 | 30.1 | 3.97 |
| Greensborough† | ..... | ..... | ..... | 3.97 |
| Greenville | 63 | 0 | 33.0 | 3.33 |
| Hamburgh | ..... | ..... | ..... | 5.48 |
| Hollidaysburgh | 61 | 2 | 33.9 | 5.60 |
| Honesdale | 58 | — 7 | 32.4 | 4.32 |
| Huntingdon | 60 | 5 | 32.5 | 4.48 |
| Indiana | 63 | — 6 | 34.1 | 3.50 |
| Johnstown† | 61 | 6 | 35.2 | 4.99 |
| Kennett Square* | 54 | 12 | 34.5 | 8.04 |
| Kilmer* | 61 | 13 | 37.8 | 4.72 |
| Lancaster | 57 | 10 | 35.5 | 6.30 |
| Lansdale† | ..... | ..... | ..... | 4.67 |
| Lebanon | 58 | 10 | 35.2 | 5.30 |
| Le Roy* | 52 | — 2 | 30.0 | 3.15 |
| Lewisburgh | 60 | 6 | 35.0 | 6.40 |
| Ligonier | 64 | 4 | 36.3 | 4.50 |
| Lock Haven† | 62 | 0 | 34.5 | 4.06 |
| Lock No. 4† | ..... | ..... | ..... | 4.04 |
| Mahoning† | ..... | ..... | ..... | 3.10 |
| Manch Chunk | ..... | ..... | 34.9 | 5.69 |
| McConnellsburgh | 58 | 7 | 34.4 | 7.45 |
| Meadville | 62 | 1 | 31.4 | 3.37 |
| Meshoppen | ..... | ..... | ..... | 4.25 |
| New Castle | 64 | — 2 | 36.4 | 3.32 |
| Nisbet* | ..... | 8 | 35.0 | 5.20 |
| Oil City† | ..... | ..... | ..... | 3.23 |
| Ottsville | ..... | ..... | ..... | 4.54 |

| Stations. | Temperature. (Fahrenheit.) Max. | Min. | Mean | Precip'n. |
|---|---|---|---|---|
| *Pennsylvania*—Con. | ° | ° | ° | *Ins.* |
| Parker's Landing† | ..... | ..... | ..... | 3.73 |
| Philadelphia (1) | ..... | ..... | ..... | 6.27 |
| Philadelphia (2) | 62 | 13 | 38.4 | 5.76 |
| Phœnixville* | 62 | 12 | 36.8 | 7.42 |
| Pleasant Mount | ..... | — 8 | 24.8 | 5.42 |
| Point Pleasant | ..... | ..... | ..... | 5.08 |
| Pottstown | 61 | 10 | 36.9 | 6.60 |
| Quakertown | 63 | 5 | 34.4 | 5.59 |
| Reading | ..... | ..... | 38.6 | 5.35 |
| Ridgway† | ..... | ..... | ..... | 2.70 |
| Rimersburgh | 60 | 2 | 31.7 | ..... |
| Salem Corners | 54 | — 2 | 33.1 | 5.63 |
| Saltsburgh† | ..... | ..... | ..... | 3.63 |
| Seisholtzville | ..... | ..... | ..... | 6.05 |
| Selin's Grove | 59 | ..... | 34.2 | 8.39 |
| Smethport | 61 | — 9 | 31.9 | ..... |
| Smith's Corners | ..... | ..... | ..... | 3.95 |
| Somerset | 63 | — 2 | 30.1 | 5.37 |
| South Easton | 58 | 0 | 33.8 | 4.54 |
| State College | 54 | 0 | 31.5 | 4.07 |
| Stoyestown† | ..... | ..... | ..... | 4.41 |
| Swarthmore | 62 | 11 | 36.8 | 5.78 |
| Troy* | 54 | 0 | 33.2 | 2.09 |
| Uniontown | 65 | 2 | 38.0 | 4.22 |
| Warren† | ..... | ..... | ..... | 2.54 |
| Wellsborough* | 56 | — 8 | 31.2 | 2.72 |
| West Chester | 60 | 10 | 35.6 | 8.33 |
| West Newton | ..... | ..... | ..... | 3.49 |
| Westtown | 62 | 12 | 37.2 | 5.38 |
| Wilkes Barre | 61 | 5 | 36.1 | 3.67 |
| Wysox | 56 | 2 | 32.6 | 3.12 |
| York | 57 | 10 | 34.9 | 6.07 |
| *Rhode Island.* | | | | |
| Bristol | 62 | 5 | 36.3 | 5.12 |
| Fort Adams | 60 | 5 | 34.0 | 2.62 |
| Kingston (1) | 57 | 5 | 34.0 | 6.96 |
| Kingston (2) | 59 | 1 | 32.8 | 7.97 |
| Lonsdale | ..... | ..... | ..... | 5.78 |
| Newport | 60 | 9 | 38.4 | ..... |
| Olneyville | 58 | 6 | 36.9 | ..... |
| Pawtucket | ..... | ..... | ..... | 5.41 |
| Providence (1) | 58 | 6 | 34.6 | 5.55 |
| Providence (2) | 57 | 2 | 34.8 | 5.07 |
| Providence (3) | 58 | 4 | 34.7 | 6.36 |
| *South Carolina.* | | | | |
| Aiken | 76 | 28 | 50.4 | 9.00 |
| Belmont | 70 | 27 | 47.1 | 14.18 |
| Brewer Mine | 70 | 26 | 48.0 | 9.73 |
| Cheraw† | 70 | 27 | 49.8 | 6.42 |
| Conway | 75 | 29 | 54.2 | 6.37 |
| Evergreen* | 70 | 20 | 46.4 | 11.60 |
| Greenville† | ..... | ..... | ..... | 11.60 |
| Kirkwood* | ..... | 27 | 47.0 | 6.95 |
| Port Royal*† | 72 | 36 | 55.9 | 4.32 |
| Simpsonville* | 73 | 27 | 44.1 | 10.91 |
| Statesburgh | 74 | 29 | 50.4 | 7.62 |
| Trial | 78 | 32 | 50.8 | 5.39 |
| Walhalla | 68 | 30 | 46.2 | 10.60 |
| Winnsborough | 72 | 30 | 51.4 | 8.90 |
| Yorkville | 73 | 25 | 48.0 | 12.47 |
| *South Dakota.* | | | | |
| Aberdeen | 50 | —26 | 15.2 | 0.40 |
| Alexandria† | 52 | —24 | 20.6 | 2.00 |
| Canton† | 48 | —20 | 22.6 | 1.20 |
| Clark | 55 | —22 | 20.0 | 1.00 |
| Cross | 60 | —22 | 27.1 | 1.77 |
| De Smet*† | ..... | — 5 | 19.6 | 0.80 |
| Elkton* | 47 | —12 | 20.4 | 1.68 |
| Flandreau† | 52 | —22 | 20.4 | 1.20 |
| Fort Bennett | 57 | —28 | 22.7 | 0.38 |
| Fort Meade | 61 | —22 | 25.0 | 1.63 |
| Fort Randall | 52 | —20 | 24.6 | 1.40 |
| Fort Sully | 55 | —24 | 23.0 | 0.65 |
| Highmore† | 52 | —17 | 18.8 | 0.83 |
| Howard† | 52 | —26 | 20.9 | 2.03 |
| Kimball*† | 51 | —17 | 18.0 | 1.00 |
| Millbank* | 56 | —18 | 26.2 | ..... |
| Onida* | 48 | —20 | 18.7 | ..... |
| Pelrichs† | 60 | —28 | 22.8 | 4.20[l] |
| Parkston* | 48 | —16 | 24.0 | 1.60 |
| Saint Lawrence* | 52 | —19 | 21.1 | 0.42 |
| Scranton | 55 | —18 | 20.2 | 1.04 |
| Sioux Falls* | 46 | —18 | 22.4 | 1.32 |
| Spearfish* | 59 | —20 | 25.1 | 1.73 |
| Webster† | 47 | —27 | 21.8 | 2.05 |
| Wolsey* | 52 | —23 | 20.1 | 2.25 |
| *Tennessee.* | | | | |
| Andersonville | 70 | 20 | 42.4 | 7.96 |
| Ashwood*† | 65 | 22 | 46.2 | 10.39 |
| Austin* | 72 | 23 | 47.6 | 11.43 |
| Carthage† | ..... | ..... | ..... | 9.30 |
| Charleston† | ..... | ..... | ..... | 9.73 |
| Clarksville | 67 | 19 | 44.7 | 9.61 |
| Clinton† | ..... | ..... | ..... | 9.78 |
| Columbia† | ..... | ..... | ..... | 10.06 |
| Covington (1)† | 70 | 23 | 46.3 | 8.36 |
| Dunlap | 66 | 20 | 48.1 | 8.64 |
| Fayetteville† | 71 | 24 | 47.5 | 7.05 |
| Florence Station | 65 | 24 | 46.4 | 9.28 |
| Franklin | 66 | 19 | 45.3 | 10.03 |
| Greeneville | 67 | 20 | 43.6 | 5.88 |
| Hohenwald | 70 | 17 | 45.0 | 12.42 |
| Jacksborough | 70 | 18 | 44.8 | 8.31 |
| Johnson City | 71 | 17 | 44.5 | 4.05 |
| Johnsonville† | ..... | ..... | ..... | 9.05 |

*Meteorological record of voluntary observers, &c.*—Continued.

| Stations. | Temperature. (Fahrenheit.) Max. | Min. | Mean | Precip'n. |
|---|---|---|---|---|
| *Tennessee*—Cont'd. | ° | ° | ° | *Ins.* |
| Kingston (1)† | ..... | ..... | ..... | 10.42 |
| Kingston Springs | 68 | 20 | 48.0 | 10.40 |
| Lewisburgh | 65 | 22 | 46.2 | 8.47 |
| Loudon† | ..... | ..... | ..... | 9.63 |
| Lynnville | 70 | 22 | 45.3 | 8.78 |
| McMinnville | 69 | 22 | 47.9 | 7.16 |
| Northville | 65 | 14 | 43.9 | 5.68 |
| Nunnelly | 64 | 20 | 46.7 | 10.80 |
| Parksville† | 66 | 23 | 46.7 | 8.14 |
| Riddleton | 70 | 20 | 45.6 | 7.37 |
| Rockwood† | ..... | ..... | ..... | 10.54 |
| Rogersville | 67 | 23 | 43.5 | 7.16 |
| Rugby† | 66 | 20 | 42.7 | 6.99 |
| Sharp | 72 | 24 | 49.0 | 11.75 |
| Springdale | 73 | 17 | 44.5 | 8.10 |
| Strawberry Plains† | ..... | ..... | ..... | 7.23 |
| Trenton | 66 | 22 | 45.0 | 7.70 |
| Union City | 64 | 19 | 44.7 | 7.90 |
| Waynesborough | 72 | 21 | 45.2 | 10.34 |
| *Texas.* | | | | |
| Austin (1) | 82 | 29 | 58.1 | 2.05 |
| Austin (2) | 85 | 29 | 57.4 | ..... |
| Berlin | 90 | 20 | 52.3 | 1.80 |
| Big Spring | ..... | ..... | ..... | 0.00 |
| Brady | 91 | 20 | 52.0 | 2.02 |
| Brazoria†* | 82 | 31 | 58.9 | 2.44 |
| Brenham† | 85 | 30 | 59.2 | 1.14 |
| Brownwood† | 90 | 19 | 51.8 | 2.13 |
| Burnet | 80 | 26 | 52.6 | 0.45 |
| Camp del Rio | 91 | 22 | 58.8 | 1.53 |
| Camp Eagle Pass | 94 | 26 | 59.9 | 1.46 |
| C'p Peña Colorado | 89 | 9 | 52.2 | 0.00 |
| College Station | 83 | 30 | 57.5 | 0.88 |
| Columbia | 80 | 32 | 60.2 | 1.32 |
| Corsicana (2) | 78 | 23 | 49.1 | 1.86 |
| Duval | 84 | 30 | 57.2 | 0.95 |
| Edinburgh | ..... | ..... | ..... | 1.31[l] |
| Epworth† | 80 | 16 | 47.6 | 0.58 |
| Forestburgh* | 86 | 20 | 50.6 | 2.72 |
| Fort Bliss | 83 | 21 | 53.8 | 0.62 |
| Fort Brown | 89 | 41 | 64.2 | 1.70 |
| Fort Clark | 88 | 24 | 61.4 | 1.08 |
| Fort Davis | 81 | 21 | 52.8 | 0.06 |
| Fort Hancock | 84 | 9 | 50.0 | 0.21 |
| Fort McIntosh | 90 | 36 | 64.2 | 2.00 |
| Fort Ringgold | 97 | 34 | 64.5 | 0.59 |
| Fredericksburgh | 84 | 27 | 53.3 | 0.84 |
| Gainesville | 78 | 15 | 49.8 | 2.78 |
| Gallinas† | 88 | 19 | 56.7 | 1.59 |
| Graham | 90 | 18 | 48.9 | 2.84 |
| Grapevine* | 84 | 22 | 49.2 | 1.90 |
| Hansford | 80 | 8 | 41.4 | 0.33 |
| Haskell | 90 | 20 | 49.4 | 1.87 |
| Houston† | 83 | 27 | 59.0 | 2.26 |
| Huntsville | 81 | 28 | 56.1 | 2.07 |
| La Grange*† | ..... | 34 | 57.4 | 1.10 |
| Longview† | 80 | 27 | 54.8 | 3.56 |
| Luling | 81 | 26 | 57.4 | 0.41 |
| Menardville | 87 | 23 | 51.5 | 1.40 |
| Mesquite | 83 | 22 | 51.2 | 2.52 |
| Mountain Springs | 83 | 21 | 48.6 | 2.76 |
| New Braunfels | 85 | 28 | 57.3 | 0.32 |
| New Ulm | 85 | 30 | 57.3 | 1.47 |
| Panhandle | 77[e] | 4[d] | 38.5[d] | 0.49 |
| Panter | 89 | 24 | 51.1 | 2.72 |
| Roby† | 92 | 20 | 51.2 | 1.02 |
| Round Rock | 82 | 26 | 55.3 | 0.79 |
| San Antonio | 85 | 29 | 57.3 | 1.18 |
| Santa Maria | ..... | ..... | ..... | 1.72 |
| Sierra Blanca | 80 | 30 | 56.0 | 0.30 |
| Silver Falls | 87 | 11 | 47.7 | 0.37 |
| Temple† | 81 | 24 | 53.0 | 1.77 |
| Venus | 88 | 23 | 52.6 | 2.79 |
| Victoria | 81[f] | 33[f] | 59.8[e] | 0.00 |
| Waco (2)† | 84 | 24 | 53.4 | 1.95 |
| Weatherford† | 88 | 10 | 50.6 | 2.26 |
| Wichita Falls* | 90 | 12 | 47.6 | 1.70 |
| *Utah.* | | | | |
| Beaver† | 73 | 10 | 38.2 | 0.33 |
| Blue Creek* | 59 | 19 | 34.4 | 1.15 |
| Corinne | 65 | 17 | 37.9 | 2.15 |
| Fort Douglas | 64 | 12 | 38.9 | 3.48 |
| Fort DuChesne | 63 | ..... | ..... | 0.57 |
| Grouse Creek | 42 | 9 | 28.6 | 1.26 |
| Kelton* | 71 | 17 | 40.6 | 0.95 |
| Lake Park | 60 | 11 | 37.5 | 5.68 |
| Levan | ..... | 12 | 32.8 | 1.46 |
| Logan | 59 | 4 | 34.8 | ..... |
| Loseet | 64 | 10 | 33.5 | 0.45 |
| Moabr | 80 | 14 | 43.5 | 0.40 |
| Mount Carmel*† | ..... | 10 | 31.1 | 1.01 |
| Nephi† | 66 | 13 | 36.7 | 1.87 |
| Ogden (1) | 66 | 16 | 37.5 | 5.12 |
| Ogden (2)*† | ..... | 16 | 39.4 | 3.80 |
| Park City | ..... | — 1 | 25.3 | 3.30 |
| Parowan* | 63[d] | 12 | 36.4 | 2.57 |
| Price† | ..... | ..... | ..... | 0.00 |
| Promontory | 61 | 20 | 33.7 | 0.80 |
| Provo City | ..... | 20 | 34.6 | 0.56 |
| Saint George† | 80 | 22 | 46.9 | 0.10 |
| Snowville | 59 | 28 | 43.4 | 1.52 |
| Stockton | ..... | 17 | 33.5 | ..... |
| Terrace* | 57 | 25 | 40.0 | 0.00 |
| *Vermont.* | | | | |
| Brattleborough (1) | 54 | — 4 | 32.0 | 3.90 |

| Stations. | Temperature. (Fahrenheit.) Max. | Min. | Mean. | Precip'n. |
|---|---|---|---|---|
| *Vermont*—Cont'd. | ° | ° | ° | *Ins.* |
| Brattleborough (2) | 54 | 1 | 31.6 | ..... |
| Burlington | 60 | — 2 | 31.1 | 1.70 |
| Chelsea* | 46 | —11 | 23.7 | 3.21 |
| Cornwall | ..... | ..... | ..... | 1.91 |
| East Berkshire† | 64 | —11 | 26.0 | 2.62 |
| Hartland† | 52 | —10 | 28.9 | 3.72 |
| Jacksonville | 58 | —18 | 26.8 | 4.23 |
| Lunenburgh* | 54 | — 7 | 28.8 | 2.16 |
| Strafford* | 48 | —12 | 27.5 | 3.20 |
| Vernon | 50 | — 8 | 27.3 | 2.59 |
| Weathersfield C'tre | 47 | — 5 | 27.5 | ..... |
| *Virginia.* | | | | |
| Abingdon | ..... | ..... | ..... | 6.30 |
| Bedford City | ..... | 22 | 38.4 | 7.52 |
| Big Stone Gap† | 68 | 16 | 43.1 | 8.68 |
| Birdsnest* | 62 | 21 | 42.3 | 9.10 |
| Bolar* | 45 | 6 | 31.5 | 7.73 |
| Casanova | 63 | 21 | 39.8 | 8.05 |
| Christiansburgh† | 63 | 13 | 37.8 | 5.76 |
| Clarksville† | ..... | ..... | ..... | 7.96 |
| Dale Enterprise† | 62 | 12 | 36.8 | 5.88 |
| Fort Monroe | 71 | ..... | ..... | 8.06 |
| Fort Myer | 60 | 16 | 38.2 | 8.37 |
| Lexington† | 64 | 13 | 38.6 | 7.13 |
| Marion | 63 | 14 | 40.0 | 5.69 |
| Mossing Ford* | 62 | 20 | 40.2 | 7.95 |
| Nottaway C. H. | 64 | 14 | 39.8 | 9.32 |
| Petersburgh† | 64 | 18 | 40.8 | 8.82 |
| Richmond† | 76 | 18 | 44.3 | 9.70 |
| Salem | ..... | 18 | 40.8 | 6.59 |
| Stanardsville | 60 | 23 | 41.6 | 7.99 |
| Staunton | 65 | 14 | 37.2 | 6.71 |
| Woodstock† | ..... | ..... | ..... | 6.77 |
| Wytheville | 60 | 14 | 38.8 | 4.95 |
| Yancey's Mills | 65 | 12 | 39.0 | 6.79 |
| *Washington.* | | | | |
| Chehalis | 63 | 20 | 42.4 | 2.19 |
| Doe Bay† | 60 | 26 | 42.0 | 2.81 |
| East Sound | 60 | 25 | 41.3 | 2.94 |
| Fort Canby | 59 | 29 | 45.0 | 5.58 |
| Fort Spokane | 61 | — 9 | 34.6 | 0.74 |
| Fort Townsend | 59 | 20 | 41.8 | 0.55 |
| Fort Walla Walla | 62 | — 2 | 37.8 | 0.67 |
| Lapush | 49 | 5 | 27.3 | 4.74 |
| Port Blakeley† | 64 | 21 | 43.6 | 0.50 |
| Seattle | 62 | 22 | 43.7 | 1.64 |
| Tacoma | 67 | 23 | 45.0 | 2.76 |
| Vancouver B'ks | 61 | 19 | 43.8 | 1.84 |
| Waterville | 58 | — 7 | 30.9 | 0.25 |
| *West Virginia.* | | | | |
| Alderson* | 60[e] | 14[d] | 38.4[d] | ..... |
| Buckhannon† | ..... | ..... | ..... | 5.46 |
| Charleston† | ..... | ..... | ..... | 5.32 |
| Ella* | 61 | 6 | 36.6 | 4.11 |
| Glenville† | ..... | ..... | ..... | 4.51 |
| Harper's Ferry† | ..... | ..... | ..... | 5.52 |
| Hinton† | ..... | ..... | ..... | 6.18 |
| Kingwood | 54 | 14 | 31.6 | ..... |
| Mont Alto* | ..... | 4 | 29.6 | ..... |
| Morgantown† | ..... | ..... | ..... | 4.15 |
| Pleasant Hill* | 59 | — 9 | 33.9 | ..... |
| Point Pleasant† | ..... | ..... | ..... | 5.29 |
| Rowlesburgh† (1) | ..... | ..... | ..... | 4.08 |
| Tannery* | 66 | — 2 | 35.6 | ..... |
| Weston | ..... | ..... | ..... | 5.67 |
| Wheeling† | ..... | ..... | ..... | 3.80 |
| White Sulp'r Sp'gs | ..... | ..... | ..... | 5.06 |
| *Wisconsin.* | | | | |
| Amherst | 47 | —21 | 22.8 | 3.00 |
| Appleton (1) | 46 | 2 | 25.3 | 2.22 |
| Bayfield | 55 | —10 | 20.4 | 2.01 |
| Beaver Dam | 45 | — 4 | 26.2 | 2.18 |
| Berlin | 52 | 0 | ..... | ..... |
| Butternut*† | ..... | —20 | 18.2 | 2.05 |
| Cadiz | ..... | — 4 | 25.6 | 2.78 |
| Centralia | 43 | —18 | 22.8 | 1.81 |
| Chippewa Falls | ..... | ..... | ..... | 1.60 |
| Columbus | 51 | —10 | 26.1 | 2.57 |
| Delevan | 51 | — 4 | 28.6 | 1.19 |
| De Pere | 51 | — 2 | 26.7 | 3.56 |
| Eau Claire | 51 | —16 | 26.5 | 1.85 |
| Ellsworth* | 48 | ..... | ..... | ..... |
| Elroy | 50 | — 8 | 28.2 | 2.27 |
| Embarrass* | 46 | —20 | 24.4 | 5.05 |
| Fond du Lac | 52 | — 8 | 26.2 | 1.90 |
| Glasgow | 46 | 4 | 32.4 | 1.70 |
| Greenwood | 54 | —21 | 23.3 | 3.12 |
| Hammond | 47 | — 8 | 23.8 | 2.31 |
| Hayward | 53 | —28 | 20.0 | 2.42 |
| Hillsborough | 51 | —15 | 24.7 | 2.70 |
| Honey Creek* | 48 | — 2 | 28.4 | 2.09 |
| Hudson | ..... | —10 | ..... | 1.38 |
| Ithaca | ..... | — 2 | 24.8 | 2.89 |
| Janesville | 57 | 3 | 30.4 | 2.25 |
| Kenosha | 57 | 6 | 30.0 | 1.89 |
| Koepenick | ..... | ..... | ..... | 2.40 |
| Lancaster | 48 | — 6 | 25.4 | 3.26 |
| Lincoln* | ..... | 8 | 27.2 | 2.76 |
| Madison | 51 | — 3 | 26.2 | 3.64 |
| Manitowoc | 50 | — 1 | 30.9 | 2.72 |
| Meadow Valley† | 48 | —16 | 24.8 | 2.05 |
| Medford (1)† | ..... | ..... | ..... | 2.23 |
| Medford (2) | 53 | —21 | 23.0 | 2.88 |
| Menomonie | 53 | —17 | 23.6 | 3.12 |
| Neilsville* | 51 | —19 | 24.6 | 2.03 |

*Meteorological record of voluntary observers, &c.*—Continued.

| Stations. | Temperature. (Fahrenheit.) Max. | Min. | Mean | Precip'n. |
|---|---|---|---|---|
| *Wisconsin*—Cont'd. | ° | ° | ° | *Ins.* |
| Oconto | 50 | —11 | 26.9 | 2.91 |
| Oshkosh † | 46 | — 1 | 25.7 | 1.83 |
| Peshtigo | 48 | —23 | 23.6 | 2.91 |
| Phillips † | 52 | —23 | 22.8 | 2.20 |
| Plover | 46 | —15 | 23.0 | 1.68 |
| Portage (1) † | ..... | ..... | ..... | 2.31 |
| Portage (2) | 50 | — 6 | 25.2 | 2.10 |
| Prairie du Chien | 58 | — 4 | 28.5 | 2.44 |
| Rhinelander | 53 | ..... | 19.4 | 2.13 |
| Whitehall † | 50 | — 9‡ | 25.7‡ | 1.92 |
| *Wyoming.* | | | | |
| Camp Pilot Butte | 54 | —19 | 26.2 | 2.13 |
| Camp Sheridan | 49 | —15 | 22.2 | 2.41 |
| Fort D. A. Russell | 69 | —16 | 28.6 | 0.47 |
| Fort Fetterman | 76 | —20 | 27.2 | 0.20 |
| Fort McKinney | 56 | —12 | 28.6 | 0.95 |
| Fort Washakie | 55 | —12 | 26.8 | 2.52 |
| Laramie | 53 | —10 | 24.9 | 1.50 |
| Lusk | 53 | —14 | 24.9 | 0.80 |
| Saratoga | 49 | —14 | 25.2 | 2.10 |
| Wheatland | 45 | —20 | 20.3 | 1.60 |
| *British Columbia.* | | | | |
| Esquimalt | 58 | 20 | 41.0 | 2.31 |
| *Canada.* | | | | |
| McGill Col. Oba'y | 49 | — 2 | 25.5 | 3.92 |
| *Mexico.* | | | | |
| La Logia* | 88 | 50 | 68.6 | 0.37 |
| Leon de Aldemas | 85 | 38 | 61.4 | 1.17 |
| Mazatlan | 78 | 64 | 72.0 | T. |
| Mexico | 82 | 39 | 60.1 | 0.82 |
| Pueblo | 86 | 36 | 64.4 | T. |
| Punta Banda | ..... | ..... | ..... | 0.13 |
| Topolobampo* | 75 | 63 | 68.6 | 0.21 |
| Zacatecas | 79 | 31 | 57.1 | 0.34 |
| *New Brunswick.* | | | | |
| Saint John | 48 | 0 | 28.5 | 3.16 |
| *Sandwich Islands.* | | | | |
| Honolulu | 82 | 53 | 70.2 | 1.38 |
| *West Indies.* | | | | |
| Grand Turk Island‡ | 82 | 77 | 79.8 | 2.38 |
| Hamilton, Bermuda | 71 | 52 | 63.0 | 7.47 |
| Havana | 91 | 57 | 75.4 | 4.40 |

*Received too late for general discussion of weather for March, 1891.*

| | | | | |
|---|---|---|---|---|
| *Arizona.* | | | | |
| Strawberry | ..... | ..... | ..... | 1.59 |
| Wood Cañon | ..... | ..... | ..... | 2.90 |
| *California.* | | | | |
| Colegrove | ..... | ..... | ..... | 0.64 |
| *Colorado.* | | | | |
| Palmer Lake* † | 60 | 1 | 29.0 | 2.36 |
| *Indiana.* | | | | |
| Richmond | 58 | — 4 | 31.5 | 4.30 |
| *Iowa.* | | | | |
| Sac City | 44 | —10 | 24.8 | 1.10 |
| *Mississippi.* | | | | |
| Edwards † | 80 | 32 | 56.0 | 8.05 |
| Enterprise | 83 | 28 | 55.1 | 7.41 |
| Hattiesburgh | 83 | 36 | 61.7 | 6.35 |
| *Nebraska.* | | | | |
| Kennedy | 62 | —15 | 26.2 | 2.90 |
| *New Mexico.* | | | | |
| Chama | 64 | —20 | 29.4 | 3.43 |
| *Ohio.* | | | | |
| Hassan* | 58 | 1 | 33.9 | 6.30 |
| *South Dakota.* | | | | |
| Brookings | 50 | —24 | 17.9 | 0.60 |
| *Tennessee.* | | | | |
| Missionary Ridge*. | ..... | 26 | 45.5 | ..... |
| *Texas.* | | | | |
| Childress | 89 | 11 | 44.6 | 0.95 |
| Coldwater | 84 | 29 | 55.8 | 1.39 |
| Colorado | 90 | 16 | 52.8 | 0.12 |
| Fort Worth | 84 | 29 | 55.8 | 1.39 |
| Snyder | ..... | 12 | 40.3 | 0.05 |
| Corsicana (1) | ..... | 22 | 51.2 | 1.92 |
| *Washington.* | | | | |
| Fort Simcoe | 62 | 8 | 41.3 | 1.05 |
| Vashon d | 68 | 28 | 46.0 | 0.14 |

*Received too late for publication in February, 1891.*

| | | | | |
|---|---|---|---|---|
| *Arizona.* | | | | |
| Bisbee | 72 | 24 | 46.6 | 1.69 |
| San Simon | 70 | 28 | 49.0 | 0.47 |
| Yuma | 73 | 36 | 55.6 | 2.53 |
| *California.* | | | | |
| Auburn | 62 | 32 | 46.4 | 6.80 |
| Ballast Point L. H. | ..... | ..... | ..... | 4.90 |
| Caliente | 64 | 40 | 48.3 | 2.83 |
| Cape Mendocino | ..... | ..... | ..... | 9.07 |
| Colegrove | ..... | ..... | ..... | 10.14 |
| Corning | 70 | 29 | 48.5 | 11.80 |
| Crescent City, L H. | ..... | ..... | ..... | 17.23 |
| East Brother L. H. | ..... | ..... | ..... | 5.48 |
| Edgwood | 45 | 10 | 33.6 | 2.45 |
| Farrallon L. H. | ..... | ..... | ..... | 5.80 |
| Galt | 80 | 35 | 50.9 | 4.36 |
| Glen Ellen | 65 | 28 | 47.1 | 15.51 |
| Humboldt L. H. | ..... | ..... | ..... | 8.29 |
| Lime Point L. H. | ..... | ..... | ..... | 7.00 |
| Mare Island L H. | ..... | ..... | ..... | 6.02 |
| Mount Hamilton | 49 | 21 | 35.0 | 7.12 |
| Ogilby | 82 | 30 | 55.5 | 1.30 |
| Piedras Blancas L. H. | ..... | ..... | ..... | 7.40 |
| Pigeon Point L. H | ..... | ..... | ..... | 6.37 |
| Pleasanton | 75 | 27 | 51.8 | 3.53 |
| P't Año Nuevo L. H. | ..... | ..... | ..... | 11.45 |
| Point Areno L. H | ..... | ..... | ..... | 6.81 |
| Point Bonita L. H | ..... | ..... | ..... | 8.45 |
| P't Conception L.H. | ..... | ..... | ..... | 9.22 |
| *California*—Cont'd. | | | | |
| P't Fermin, L. H. | ..... | ..... | ..... | 5.31 |
| P't Hueneme L. H. | ..... | ..... | ..... | 8.22 |
| P't Montara L. H. | ..... | ..... | ..... | 12.53 |
| Point Pinos L. H | ..... | ..... | ..... | 5.25 |
| Point Reyes L H | ..... | ..... | ..... | 8.71 |
| Point Sur L. H. | ..... | ..... | ..... | 8.43 |
| Sacramento (2) | 64 | 31 | 48.6 | 4.61 |
| San Luis L. H | ..... | ..... | ..... | 5.28 |
| Santa Barbara L. H. | ..... | ..... | ..... | 7.70 |
| Santa Cruz L H | ..... | ..... | ..... | 9.22 |
| Trinidad L H | ..... | ..... | ..... | 9.74 |
| Whittier | 77 | 40 | 53.4 | 8.37 |
| Woodland | 60 | 28 | 44.0 | 8.08 |
| Yerba Buena L. H | ..... | ..... | ..... | 7.35 |
| *Georgia.* | | | | |
| Diamond | ..... | 20 | 49.4 | 18.27 |
| *Indiana.* | | | | |
| Logansport (1) | ..... | ..... | ..... | 3.61 |
| *Mississippi.* | | | | |
| Enterprise | 80 | 21 | 55.7 | 4.94 |
| *Nebraska.* | | | | |
| Kennedy | 49 | —19 | 15.1 | 2.40 |
| *New York.* | | | | |
| Ogdensburgh (2) | 47 | —10 | 22.6 | ..... |
| *Mexico.* | | | | |
| Punta Banda | ..... | ..... | ..... | 6.38 |
| *Dutch Guiana.* | | | | |
| Burnside Coronie | 85 | 68 | 77.1 | 10.44 |

Letters of the alphabet denote the number of days missing from the record, thus: the letter *c* indicates three days missing, etc., etc.

*Extremes of temperature from observed readings. †Signal Service instruments. ‡One observation daily at 10 a. m.

Corrections: Sacramento (2), Cal., February, 1891, page 46, should be Sacramento (3); La Grande, Oregon, February, 1891, maximum temperature should be 49; Ashland (1), Oregon, February, 1891, total precipitation should be 4.50; Portage, Wis., January, 1891, page 21, should be Portage (2).

*Mean temperature (degrees Fahr.) observed at Vevay, Ind., by Prof. C. G. Bærner, voluntary observer.*

| Year. | January. | February. | March. | April. | May. | June. | July. | August. | September. | October. | November. | December. | Annual. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1864 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 45.2 | 34.0 | ..... |
| 1865 | 25.6 | 37.5 | 48.5 | 55.7 | 63.4 | 76.3 | 76.6 | 73.6 | 75.7 | 53.3 | 42.6 | 36.0 | 55.4 |
| 1866 | 31.9 | 32.6 | 44.4 | 60.5 | 62.3 | 76.7 | 83.8 | 75.0 | 68.1 | 58.0 | 44.8 | 31.5 | 55.6 |
| 1867 | 24.3 | 41.1 | 38.1 | 57.3 | 60.4 | 77.9 | 79.2 | 79.1 | 72.9 | 57.2 | 46.3 | 34.4 | 55.7 |
| 1868 | 29.0 | 33.3 | 50.1 | 52.0 | 66.6 | 76.1 | 84.3 | 75.9 | 65.5 | 54.1 | 43.6 | 29.6 | 55.0 |

*Mean temperature (degrees Fahr.) observed at Vevay, Ind.*—Cont'd.

| Year. | January. | February. | March. | April. | May. | June. | July. | August. | September. | October. | November. | December. | Annual. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1869 | 30.8 | ..... | ..... | ..... | ..... | 68.4 | 73.0 | 73.6 | 63.0 | 43.2 | 33.0 | 28.8 | ..... |
| 1870 | 34.7 | 34.2 | 39.2 | 55.2 | 66.2 | 72.3 | 77.6 | 74.9 | 71.0 | 57.6 | 44.7 | 31.9 | 55.0 |
| 1872 | 28.9 | 33.2 | 37.1 | 57.4 | 66.8 | 72.5 | 77.2 | 76.2 | 68.0 | 54.3 | 37.3 | 26.7 | 53.0 |
| 1873 | 28.2 | 33.2 | 39.7 | 52.6 | 65.5 | 75.2 | 76.6 | 75.7 | 67.2 | 51.3 | 38.6 | 37.8 | 53.5 |
| 1874 | 35.3 | 37.8 | 43.6 | 47.4 | 65.9 | 76.5 | 77.2 | 74.9 | 69.1 | 56.0 | 43.9 | 38.2 | 55.5 |
| 1875 | 24.9 | 26.5 | 40.0 | 50.0 | 62.8 | 70.7 | 75.4 | 69.9 | 63.8 | 52.1 | 42.9 | 43.2 | 51.8 |
| 1876 | 40.8 | 38.6 | 40.1 | 54.2 | 65.9 | 71.9 | 77.1 | 75.2 | 66.0 | 52.0 | 41.1 | 24.6 | 54.1 |
| 1877 | 29.2 | 38.8 | 40.1 | 54.6 | 60.8 | 72.1 | 75.7 | 73.4 | 66.8 | 59.2 | 43.7 | 44.8 | 54.9 |
| 1878 | 34.0 | 38.2 | 50.7 | 60.0 | 62.7 | 69.4 | 79.8 | 77.0 | 68.4 | 56.0 | 45.8 | 28.8 | 55.9 |
| 1879 | 27.0 | 32.9 | 45.9 | 53.8 | 69.2 | 73.6 | 81.4 | 74.0 | 65.5 | 65.0 | 48.7 | 40.4 | 56.4 |
| 1880 | 47.2 | 41.6 | 45.1 | 58.6 | 71.2 | 74.5 | 76.4 | 77.8 | 68.6 | 56.4 | 35.3 | 26.5 | 56.6 |
| 1881 | 25.8 | 33.4 | 39.7 | 50.5 | 69.7 | 74.3 | 80.2 | 80.7 | 76.3 | 64.2 | 46.4 | 42.2 | 56.9 |
| 1882 | 36.0 | 45.5 | 50.3 | 56.6 | 62.4 | 72.8 | 73.9 | 74.0 | 69.1 | 63.5 | 46.8 | 33.9 | 57.1 |
| 1883 | 31.0 | 39.2 | 41.0 | 57.4 | 64.6 | 73.1 | 77.3 | 73.3 | 68.0 | 59.1 | 47.8 | 37.0 | 55.7 |
| 1884 | 23.0 | 40.2 | 45.0 | 52.2 | 64.3 | 73.9 | 74.8 | 73.0 | 72.4 | 62.3 | 45.1 | 34.0 | 55.0 |
| 1885 | 26.7 | 25.1 | 35.7 | 55.0 | 63.8 | 71.9 | 78.4 | 74.3 | 66.7 | 53.9 | 46.5 | 36.9 | 52.9 |
| 1886 | 27.3 | 30.6 | 43.4 | 55.9 | 67.3 | 70.6 | 75.4 | 75.0 | 69.3 | 56.6 | 42.7 | 29.6 | 53.6 |
| 1887 | 30.4 | 41.3 | 42.9 | 53.9 | 68.6 | 73.4 | 81.1 | 76.2 | 68.5 | 52.7 | 42.7 | 35.5 | 55.6 |
| 1888 | 29.9 | 33.8 | 39.8 | 56.1 | 62.2 | 74.2 | 76.7 | 74.1 | 64.3 | 51.7 | 46.8 | 37.4 | 54.9 |
| 1889 | 37.0 | 32.1 | 45.9 | 56.1 | 64.2 | 70.2 | 75.3 | 72.4 | 65.3 | 51.6 | 43.5 | 49.0 | 55.2 |
| 1890 | 43.9 | 44.2 | 39.4 | 56.6 | 64.3 | 77.4 | 76.0 | 71.6 | 66.0 | 56.4 | 42.0 | 35.9 | 56.6 |
| Mean | 31.3 | 36.0 | 42.7 | 55.0 | 65.0 | 73.4 | 77.6 | 74.9 | 68.2 | 56.0 | 43.6 | 34.9 | 54.9 |

*Precipitation (inches and hundredths) observed at Vevay, Ind., by Prof. C. G. Bærner, voluntary observer.*

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1865 | 1.50 | 4.82 | 5.73 | 11.80 | 2.45 | 4.70 | 1.98 | 6.51 | 1.55 | 1.25 | 6.70 | [3.72] | [52.71 |
| 1866 | 4.06 | 1.84 | 5.72 | 1.68 | 1.50 | 5.28 | 6.95 | 1.47 | 5.25 | 1.48 | 4.22 | 3.09 | 52.55 |
| 1867 | 6.18 | 7.34 | 5.52 | 1.70 | 4.25 | 3.20 | 3.95 | 4.09 | 0.77 | 1.64 | 3.50 | 6.40 | 48.54 |
| 1868 | 6.20 | 0.90 | 5.40 | 3.65 | 5.93 | [4.95] | 1.17 | 4.29 | 6.72 | 1.30 | 1.72 | 2.82 | [45.05 |
| 1869 | 1.87 | 4.05 | 5.40 | 3.94 | 5.95 | 4.54 | 0.90 | 2.10 | 3.05 | 2.97 | 4.74 | 3.47 | 42.98 |
| 1870 | 7.18 | 2.47 | 3.93 | 2.37 | 2.37 | 3.80 | 3.20 | 2.55 | 1.20 | 2.43 | 1.50 | 2.13 | 35.13 |
| 1871 | 2.52 | 4.39 | 4.74 | 2.77 | 3.16 | 2.30 | 3.82 | 4.06 | 0.47 | 1.00 | 3.09 | 3.75 | 36.07 |
| 1872 | 0.75 | 2.22 | 1.04 | 7.18 | 4.15 | 6.67 | 5.16 | 3.55 | 3.17 | 4.05 | 0.73 | 2.57 | 41.24 |
| 1873 | 2.39 | 4.30 | 4.33 | 2.14 | 3.64 | 1.36 | 3.58 | 2.80 | 1.69 | 4.66 | 1.87 | 5.36 | 36.12 |
| 1874 | 3.05 | 4.20 | 3.85 | 3.97 | 0.52 | 8.10 | 9.80 | 1.60 | 0.60 | 0.82 | 3.59 | 2.90 | 43.00 |
| 1875 | 1.87 | 2.24 | 4.14 | 1.74 | 4.77 | 8.41 | 7.33 | 2.59 | 0.45 | 2.60 | 4.30 | 6.02 | 40.49 |
| 1876 | 9.03 | 2.67 | 4.90 | 3.95 | 1.20 | 5.42 | 3.67 | 6.15 | 1.53 | 3.79 | 1.61 | 1.20 | 45.12 |
| 1877 | 3.09 | 0.40 | 5.04 | 1.92 | 2.04 | 6.05 | 3.08 | 1.95 | 1.44 | 1.55 | 3.73 | 3.02 | 33.31 |
| 1878 | 3.75 | 3.05 | 3.72 | 4.45 | 3.45 | 3.95 | 5.25 | 2.22 | 2.10 | 1.89 | 2.93 | 3.92 | 40.68 |
| 1879 | 1.61 | 1.48 | 3.41 | 2.37 | 0.95 | 4.10 | 2.22 | 10.90 | 5.10 | 0.28 | 3.75 | 7.60 | 43.77 |
| 1880 | 5.50 | 4.25 | 4.30 | 6.12 | 3.70 | 6.69 | 2.80 | 1.82 | 1.40 | 4.27 | 5.33 | 5.69 | 51.87 |
| 1881 | 3.80 | 3.35 | 2.40 | 4.30 | 1.65 | 5.45 | 2.40 | 1.22 | 5.05 | 7.20 | 3.85 | 5.30 | 45.97 |
| 1882 | 6.40 | 6.70 | 6.30 | 0.98 | 8.65 | 6.53 | 4.50 | 5.99 | 2.85 | 0.84 | 1.52 | 2.85 | 54.11 |
| 1883 | 3.31 | 7.56 | 4.31 | 6.89 | 3.49 | 4.17 | 4.83 | 2.27 | 4.27 | 7.67 | 5.73 | 5.85 | 60.35 |
| 1884 | 3.02 | 10.23 | 1.37 | 1.99 | 5.17 | 4.20 | 3.41 | 0.54 | 5.83 | 0.95 | 1.13 | 3.83 | 41.17 |
| 1885 | 5.45 | 2.46 | 1.58 | 4.69 | 2.47 | 3.82 | 2.46 | 3.82 | 3.08 | 2.62 | 2.40 | 2.02 | 36.93 |
| 1886 | 3.57 | 1.51 | 2.18 | 2.55 | 4.36 | 7.39 | 1.55 | 3.18 | 1.47 | 0.91 | 4.54 | 2.89 | 36.10 |
| 1887 | 4.18 | 8.28 | 2.78 | 7.07 | 3.99 | 1.98 | 2.21 | 2.02 | 3.39 | 0.67 | 3.05 | 3.29 | 42.91 |
| 1888 | 4.20 | 1.64 | 4.23 | 1.90 | 2.51 | 1.69 | 5.92 | 8.04 | 4.22 | 4.13 | 6.34 | 1.16 | 45.98 |
| 1889 | 2.82 | 1.47 | 0.85 | 0.92 | 6.17 | 4.46 | 6.93 | 0.02 | 5.19 | 2.55 | 6.06 | 2.81 | 40.25 |
| 1890 | 7.37 | 6.06 | 7.84 | 4.33 | 4.73 | 9.50 | 5.61 | 3.46 | 2.81 | 3.07 | 2.92 | 3.03 | 60.73 |
| Mean | 4.03 | 3.84 | 4.04 | 3.74 | 3.59 | 4.95 | 4.03 | 3.43 | 3.24 | 2.56 | 3.50 | 3.72 | 44.67 |

Interpolated values are given in brackets.

*Mean temperature (degrees Fahr.) observed at Aiken, S. C., by H. W. Ravenal, J. H. Cornish, and Dr. W. H. Geddings, voluntary observers.*

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1856 | 34.8 | 45.4 | 50.5 | 65.5 | 69.0 | 78.9 | 80.2 | 78.6 | 70.8 | 61.1 | 56.0 | 43.5 | 61.2 |
| 1857 | 35.9 | 58.9 | 51.6 | 55.7 | 68.8 | 77.5 | 76.4 | 79.9 | 75.1 | 61.9 | 52.7 | 51.2 | 62.1 |
| 1858 | 49.2 | 44.4 | 52.3 | 62.9 | 71.1 | 78.7 | 78.5 | 77.8 | 68.9 | 65.0 | 44.1 | 51.6 | 62.0 |
| 1859 | 44.0 | 49.4 | 57.5 | 60.2 | 69.4 | 75.9 | 77.8 | 74.4 | 72.7 | 60.3 | 55.6 | 46.2 | 62.0 |
| 1860 | 46.7 | 48.3 | 53.7 | 66.6 | 71.5 | 76.3 | 81.8 | 77.5 | 73.0 | 63.6 | 51.7 | 39.7 | 62.5 |
| 1861 | 45.3 | 49.6 | 52.8 | 61.8 | 69.4 | 78.7 | 77.0 | 74.5 | 71.7 | 62.6 | 53.6 | 47.7 | 60.4 |
| 1862 | 49.8 | 50.4 | 51.6 | 61.9 | 68.6 | 73.6 | 75.4 | 76.4 | 72.9 | 61.6 | [49.0] | 47.7 | [61.6 |
| 1863 | 45.0 | 47.9 | 51.4 | 59.3 | 68.8 | 73.0 | 77.7 | 77.0 | 68.6 | 60.4 | 55.0 | 46.0 | 60.8 |
| 1864 | 43.2 | 47.0 | 50.4 | 58.3 | [72.6] | 72.3 | 77.7 | 77.0 | 72.2 | 59.3 | [49.0] | 48.7 | [60.6 |
| 1865 | 39.4 | 46.0 | 55.6 | 66.6 | 70.1 | 75.0 | 81.0 | 76.2 | 75.5 | 60.3 | [49.0] | 50.5 | [62.1 |
| 1866 | 45.0 | 46.6 | 54.4 | 66.5 | 68.0 | 74.5 | 79.8 | 80.3 | 75.9 | 62.3 | 52.3 | 42.1 | 62.3 |
| 1867 | 40.9 | 54.5 | 51.8 | 61.4 | 69.0 | 73.6 | 78.8 | 75.8 | 73.8 | 61.6 | 56.0 | 50.7 | 62.3 |
| 1868 | 44.6 | 44.8 | 56.8 | 60.1 | 68.9 | 75.3 | 79.6 | 76.6 | 74.0 | 61.4 | 49.4 | 41.7 | 61.1 |
| 1869 | 49.8 | 48.4 | 53.6 | 62.0 | 67.7 | 76.7 | 80.9 | 78.7 | 70.6 | 58.6 | 50.2 | 46.1 | 61.1 |
| 1870 | 48.9 | 46.0 | 51.8 | 61.9 | 71.9 | 75.2 | 81.8 | 78.8 | 72.4 | 65.7 | 52.1 | 41.4 | 62.3 |
| 1871 | ..... | ..... | 59.4 | ..... | 69.9 | 78.2 | 78.9 | 76.3 | 69.6 | ..... | ..... | ..... | ..... |
| 1872 | ..... | 45.7 | ..... | ..... | 72.7 | ..... | ..... | ..... | ..... | 62.1 | 49.4 | 42.4 | ..... |
| 1873 | 44.9 | 50.4 | 52.6 | 65.5 | 73.1 | 78.7 | 80.3 | 78.0 | 73.2 | 60.4 | 52.1 | 48.7 | 63.2 |
| 1874 | 50.4 | 51.0 | 59.2 | 66.1 | 74.1 | 82.7 | 80.1 | 80.1 | 75.8 | 66.5 | 55.7 | 48.6 | 65.9 |
| 1875 | 42.9 | 45.8 | 53.8 | 60.6 | 72.7 | 77.4 | 82.9 | 76.1 | 76.1 | 59.5 | 55.0 | 54.0 | 58.9 |
| 1876 | 52.0 | 49.8 | 53.0 | ..... | ..... | ..... | ..... | ..... | ..... | 59.7 | 51.5 | 37.7 | ..... |
| 1877 | 46.0 | 48.6 | 53.4 | 62.4 | 64.3 | 78.6 | 84.2 | 78.8 | 73.9 | 65.3 | 53.1 | 49.9 | 63.2 |
| 1878 | 43.5 | 46.8 | 60.0 | 64.6 | 71.0 | 75.7 | 84.2 | 83.0 | 76.3 | 66.0 | 58.2 | 43.6 | 64.4 |
| 1879 | 47.7 | 46.6 | 61.9 | 62.5 | 73.0 | ..... | ..... | ..... | ..... | 68.3 | 56.6 | 54.8 | ..... |
| 1880 | 56.0 | 53.9 | 58.4 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 50.3 | 44.4 | ..... |
| 1881 | 41.4 | 49.1 | 51.5 | 60.0 | 73.7 | 82.0 | 86.0 | [79.0] | 80.0 | 70.9 | 59.8 | 52.2 | [65.5 |
| 1882 | 49.7 | 54.7 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 51.2 | 43.2 | ..... |
| 1883 | 46.9 | 54.6 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 57.4 | 51.9 | ..... |
| 1884 | 40.3 | 55.3 | 58.1 | 60.7 | 75.7 | ..... | ..... | ..... | ..... | ..... | 53.7 | 48.6 | ..... |
| 1885 | 46.0 | 45.8 | 49.6 | 65.8 | 70.4 | ..... | ..... | ..... | ..... | ..... | 53.6 | 46.0 | ..... |
| 1886 | 40.5 | ..... | 55.3 | 65.3 | ..... | ..... | 79.5 | 79.8 | 76.7 | ..... | 56.0 | 45.0 | ..... |
| 1887 | 32.2 | 56.0 | 54.2 | 64.6 | 74.4 | 79.5 | ..... | ..... | ..... | 60.9* | 53.6 | 49.5 | ..... |
| 1888 | 48.2 | 51.0 | 54.3 | 66.9 | 71.9 | 79.0 | 80.4 | 78.9 | 69.7 | 61.7 | 54.9 | 46.4 | 63.6 |
| 1889 | 47.2 | 45.0 | 53.8 | 64.0 | 71.6 | ..... | ..... | ..... | ..... | ..... | 55.4 | 50.0 | ..... |
| 1890 | 55.3 | 58.3 | 53.8 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 59.5 | 48.4 | ..... |
| Mean | 45.3 | 49.6 | 54.3 | 62.8 | 70.8 | 77.0 | 80.0 | 77.9 | 73.3 | 62.6 | 53.3 | 47.3 | 62.8 |

Interpolated values are given in brackets.

*Record for 23 days.

*Precipitation (inches and hundredths) observed at Washington City by Signal Service observers and others.*

| Year. | January. | February. | March. | April. | May. | June. | July. | August. | September. | October. | November. | December. | Annual. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1824 | 1.50 | 2.65 | 1.98 | 4.30 | 1.58 | 4.26 | 2.45 | 2.43 | 2.62 | 1.23 | 1.24 | 2.76 | 29.00 |
| 1825 | 1.62 | 2.27 | 3.83 | 3.35 | 2.37 | 2.66 | 1.87 | 1.35 | 0.45 | 1.68 | 0.24 | 2.76 | 24.45 |
| 1826 | 0.60 | 2.01 | 1.68 | 0.45 | 0.80 | 1.87 | 2.60 | 2.37 | 1.60 | 1.08 | 2.05 | 1.62 | 18.79 |
| 1827 | 0.48 | 2.85 | 1.18 | 1.97 | 2.25 | 1.37 | ..... | ..... | ..... | 1.02 | 2.57 | 2.21 | ..... |
| 1828 | 1.88 | 3.24 | 3.33 | 4.00 | 3.24 | 1.59 | 1.91 | 1.39 | 1.37 | 1.04 | 0.05 | 0.45 | 23.55 |
| 1829 | 6.20 | 2.00 | 2.74 | 3.12 | 2.49 | 1.79 | 7.84 | 5.23 | 3.12 | 1.78 | 3.81 | 2.97 | 43.09 |
| 1836 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 47.37 |
| 1837 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 31.80 |
| 1838 | ..... | ..... | ..... | ..... | ..... | ..... | 3.08 | 0.92 | 8.29 | 3.96 | 3.41 | 1.70 | 35.10 |
| 1839 | 4.74 | 2.68 | 0.94 | 2.66 | 3.67 | 3.96 | 3.95 | 6.03 | 1.86 | 1.58 | 4.99 | 1.27 | 38.33 |
| 1840 | [3.05] | 2.60 | 1.90 | 3.92 | 2.06 | 2.66 | 5.16 | 3.10 | 2.13 | 4.70 | 1.70 | 3.50 | [36.47] |
| 1841 | 6.90 | 1.79 | 5.66 | 4.72 | 2.73 | 2.09 | 3.50 | 4.70 | 1.81 | 3.98 | 2.24 | 4.99 | 45.11 |
| 1842 | 1.73 | 3.89 | 1.75 | 4.84 | 6.96 | 3.00 | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| 1846 | 2.21 | 1.66 | 3.15 | 3.22 | 5.68 | 50.2 | 3.47 | 5.44 | 0.26 | 3.36 | 6.57 | 1.57 | 41.61 |
| 1847 | 2.01 | 5.22 | 2.18 | 0.31 | 1.31 | 2.62 | 3.03 | 2.79 | 4.79 | 6.84 | 2.25 | 2.47 | 35.82 |
| 1848 | 1.87 | 1.04 | 1.64 | 0.89 | 2.64 | 2.53 | 5.26 | 1.44 | 1.20 | 2.32 | 1.27 | 1.14 | 23.24 |
| 1852 | 2.45 | 2.87 | 2.53 | 3.90 | 1.13 | 3.76 | 4.13 | 8.77 | 0.85 | 1.49 | 5.03 | 3.59 | 40.50 |
| 1853 | 1.19 | 3.48 | 2.48 | 3.90 | 3.99 | 1.84 | 3.37 | 3.69 | 3.76 | 3.86 | 1.64 | 1.23 | 33.43 |
| 1854 | 3.75 | 4.93 | 1.69 | 5.23 | 2.53 | 1.57 | 1.68 | 0.63 | 3.20 | 1.91 | 3.59 | 0.82 | 31.57 |
| 1855 | 1.69 | 1.53 | 1.51 | 1.04 | 1.34 | 5.51 | 4.15 | 2.42 | 3.13 | 3.38 | 1.06 | 2.98 | 29.74 |
| 1856 | 3.79 | 0.60 | 1.63 | 2.54 | 3.94 | 5.94 | 3.58 | 3.71 | 1.85 | 1.80 | 2.01 | 2.25 | 33.64 |
| 1857 | 1.34 | 0.52 | 1.39 | 2.33 | 5.60 | 5.98 | 4.31 | 9.13 | 1.80 | 2.04 | 1.35 | 5.64 | 41.43 |
| 1858 | 1.89 | 1.31 | 0.95 | 3.77 | 6.90 | 1.58 | 4.54 | 4.03 | 2.74 | 2.52 | 3.83 | 5.52 | 39.58 |
| 1859 | 4.20 | 3.08 | 3.50 | 4.50 | 3.35 | 4.73 | 1.52 | 2.91 | 5.90 | 2.35 | 1.70 | 4.58 | 42.32 |
| 1860 | 2.52 | 2.12 | 0.94 | 3.35 | 5.78 | 2.29 | 2.53 | 4.73 | 4.31 | 3.72 | 3.10 | 2.24 | 37.63 |
| 1861 | 3.93 | 1.84 | 2.36 | 4.73 | 3.03 | 3.82 | 5.34 | 7.20 | 2.37 | 3.72 | 4.30 | 1.00 | 43.64 |
| 1862 | 3.00 | 2.94 | 4.98 | 5.18 | 2.50 | 4.41 | 5.48 | 2.30 | 1.70 | 3.02 | 2.57 | 0.98 | 39.06 |
| 1863 | 4.40 | 3.47 | 5.33 | 5.02 | 3.15 | 1.84 | 7.88 | 1.06 | 2.84 | 4.51 | 1.96 | 3.07 | 45.13 |
| 1864 | 2.42 | 0.33 | 5.38 | 6.93 | 4.57 | 0.80 | 1.36 | 4.16 | 2.51 | 1.30 | 3.36 | 3.16 | 30.28 |
| 1865 | 4.23 | 2.35 | 5.60 | 3.93 | 6.13 | 5.10 | 7.52 | 1.46 | 3.11 | 2.08 | 2.24 | 5.01 | 48.76 |
| 1866 | 3.35 | 4.95 | 0.95 | 3.36 | 2.52 | 3.33 | 7.85 | 1.98 | 5.80 | 10.61 | 1.71 | 2.97 | 49.38 |
| 1867 | 1.38 | 5.83 | 9.17 | 2.21 | 5.51 | 6.31 | 2.60 | 11.22 | 2.20 | 6.74 | 1.27 | 3.38 | 57.82 |
| 1868 | 4.10 | 1.96 | 2.18 | 3.03 | 5.16 | 5.31 | 5.27 | 5.04 | 5.70 | 1.97 | 4.20 | 3.07 | 46.99 |
| 1869 | 4.53 | 4.36 | 3.81 | 2.20 | 4.77 | 3.56 | 2.94 | 0.79 | 2.36 | 7.21 | 1.96 | 5.42 | 43.91 |
| 1870 | 2.66 | 2.68 | 3.96 | 3.70 | 4.63 | 4.34 | 4.11 | 2.05 | 2.00 | 4.27 | 1.43 | 0.46 | 30.31 |
| 1871 | 2.20 | 1.99 | 5.92 | 1.54 | 3.45 | 4.78 | 6.10 | 1.59 | 2.70 | 1.50 | 4.85 | 1.36 | 37.98 |
| 1872 | 0.23 | 0.93 | 3.22 | 1.74 | 1.43 | 2.78 | 0.82 | 5.72 | 3.92 | 4.83 | 2.75 | 2.49 | 30.86 |
| 1873 | 3.73 | 4.69 | 3.03 | 3.19 | 5.21 | 1.63 | 4.30 | 0.83 | 3.48 | 5.62 | 3.02 | 0.97 | 45.70 |
| 1874 | 1.89 | 1.84 | 2.06 | 5.65 | 2.82 | 3.47 | 2.34 | 1.71 | 7.84 | 0.29 | 2.08 | 2.39 | 34.58 |
| 1875 | 1.86 | 2.65 | 3.96 | 2.29 | 1.01 | 2.06 | 3.05 | 12.93 | 1.98 | 1.86 | 3.95 | 3.51 | 41.11 |
| 1876 | 1.68 | 3.56 | 5.52 | 2.43 | 3.02 | 4.59 | 5.12 | 4.17 | 10.81 | 2.99 | 2.83 | 1.30 | 47.96 |
| 1877 | 3.73 | 1.16 | 3.58 | 4.87 | 2.26 | 5.92 | 6.50 | 2.74 | 4.93 | 6.50 | 7.18 | 3.22 | 52.59 |
| 1878 | 4.77 | 2.54 | 4.31 | 3.32 | 5.27 | 6.33 | 8.37 | 8.89 | 2.46 | 5.86 | 3.03 | 4.94 | 60.09 |
| 1879 | 3.13 | 1.87 | 1.74 | 2.39 | 1.58 | 3.29 | 3.36 | 7.36 | 1.56 | 0.79 | 1.10 | 4.66 | 32.83 |
| 1880 | 2.51 | 1.71 | 5.60 | 3.81 | 3.37 | 3.52 | 2.25 | 3.83 | 3.42 | 2.31 | 2.48 | 4.02 | 38.83 |
| 1881 | 5.14 | 4.01 | 6.61 | 2.08 | 1.86 | 5.71 | 1.67 | 1.07 | 2.19 | 3.29 | 2.45 | 6.12 | 42.20 |
| 1882 | 7.09 | 5.09 | 3.75 | 2.55 | 5.00 | 2.33 | 4.46 | 4.44 | 7.84 | 0.53 | 1.33 | 2.38 | 46.79 |
| 1883 | 3.15 | 5.08 | 3.27 | 4.09 | 2.50 | 8.55 | 4.73 | 3.30 | 4.33 | 2.63 | 1.19 | 2.89 | 45.71 |
| 1884 | 5.59 | 6.84 | 7.24 | 1.86 | 3.09 | 6.95 | 7.39 | 1.01 | 0.14 | 1.73 | 3.42 | 4.70 | 49.96 |
| 1885 | 4.46 | 4.63 | 1.53 | 1.71 | 2.85 | 3.30 | 3.03 | 6.49 | 2.15 | 8.69 | 3.33 | 2.67 | 44.84 |
| 1886 | 5.01 | 4.32 | 6.41 | 2.71 | 10.60 | 6.75 | 10.63 | 2.43 | 1.79 | 1.20 | 2.88 | 3.44 | 58.17 |
| 1887 | 2.39 | 3.42 | 3.83 | 3.24 | 2.30 | 2.99 | 3.29 | 2.34 | 3.12 | 1.82 | 1.83 | 4.31 | 35.08 |
| 1888 | 2.99 | 3.19 | 4.53 | 1.89 | 4.77 | 3.53 | 4.47 | 3.35 | 6.82 | 3.27 | 2.97 | 3.27 | 45.05 |
| 1889 | 4.05 | 2.47 | 4.30 | 9.13 | 10.69 | 5.01 | 8.13 | 3.07 | 3.88 | 4.48 | 6.03 | 0.19 | 61.33 |
| 1890 | 1.54 | 4.20 | 3.65 | 2.81 | 4.73 | 2.02 | 3.24 | 5.50 | 4.22 | 5.15 | 0.79 | 3.74 | 41.59 |
| Mean | 3.05 | 2.89 | 3.39 | 3.31 | 3.70 | 3.71 | 4.27 | 3.99 | 3.28 | 3.24 | 2.70 | 2.89 | 40.42 |

NOTE.—The average rainfall at Washington City for the twenty years ending December, 1890 (Signal Service observations), is 44.66 inches.

*Mean temperature (degrees Fahr.) observed at Atlanta, Ga., by Dr. J. G. Westmoreland, F. Deckner & Son, U. S. Army surgeons, and Signal Service observers.*

| Year. | January. | February. | March. | April. | May. | June. | July. | August. | September. | October. | November. | December. | Annual. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1859 | 42.8 | 46.6 | 54.5 | 58.6 | 68.8 | 74.0 | 76.1 | 73.1 | 69.0 | 57.8 | 54.6 | 42.0 | 59.8 |
| 1865 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 57.3 | 47.5 | ..... |
| 1866 | 41.6 | 41.8 | 51.7 | 61.6 | [64.9] | 68.9 | [78.4] | [75.7] | 67.7 | [57.0] | 45.8 | 36.0 | [57.6] |
| 1867 | 35.3 | 48.5 | 47.4 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 45.6 | ..... |
| 1868 | 36.5 | 40.2 | 52.9 | 57.6 | 65.8 | 71.9 | 77.2 | 73.1 | 68.7 | 57.2 | 44.0 | 37.2 | 56.9 |
| 1869 | 45.7 | 43.5 | 49.4 | 58.3 | 62.7 | 72.2 | [75.5] | 75.3 | 65.8 | 52.1 | 44.3 | 38.8 | [57.0] |
| 1870 | 43.8 | 40.3 | 51.1 | 54.3 | 66.6 | 72.2 | [80.8] | [80.3] | [73.6] | 63.9 | 53.8 | 41.7 | [60.2] |
| 1871 | 48.1 | 50.9 | 57.7 | 65.2 | 68.4 | 78.5 | 79.9 | 80.9 | 71.3 | 66.3 | 56.3 | 44.5 | 64.0 |
| 1872 | 39.5 | 46.5 | 49.8 | 64.7 | 72.4 | 77.8 | 80.6 | 80.1 | 75.2 | 64.8 | 50.3 | 42.8 | 62.0 |
| 1873 | 42.8 | 49.4 | 50.8 | 62.4 | 70.9 | 76.2 | 79.6 | 78.2 | 72.4 | 59.8 | 49.7 | 45.1 | 61.4 |
| 1874 | 45.2 | 46.6 | 54.0 | 59.2 | 71.2 | 78.2 | 77.8 | 77.4 | 72.9 | 62.5 | 54.4 | 46.8 | 62.2 |
| 1875 | 40.8 | 43.2 | 52.6 | 59.8 | 71.2 | 77.7 | 82.2 | 75.6 | 70.6 | 58.8 | 54.4 | 50.8 | 61.5 |
| 1876 | 50.6 | 47.5 | 49.0 | 60.3 | 69.3 | 75.3 | 81.1 | 80.1 | 72.4 | 60.1 | 49.1 | 35.2 | 60.8 |
| 1877 | 43.7 | 47.4 | 50.2 | 60.1 | 67.2 | 77.3 | 81.8 | 77.4 | 71.4 | 62.1 | 47.9 | 48.1 | 61.6 |
| 1878 | 40.2 | 43.8 | 58.4 | 63.5 | 70.2 | 73.2 | 81.2 | 79.2 | 71.6 | 59.5 | 52.9 | 40.6 | 61.2 |
| 1879 | 44.1 | 43.7 | 57.0 | 59.5 | 70.2 | 75.3 | 79.8 | 73.4 | 69.1 | 63.7 | 51.3 | 50.9 | 61.5 |
| 1880 | 54.1 | 50.8 | 55.6 | 63.4 | 70.2 | 76.3 | 76.8 | 76.1 | 68.9 | 60.6 | 47.7 | 43.4 | 62.0 |
| 1881 | 40.1 | 46.0 | 48.7 | 59.1 | 70.1 | 77.6 | 80.9 | 78.1 | 74.9 | 66.6 | 52.3 | 49.3 | 62.0 |
| 1882 | 48.1 | 52.2 | 57.0 | 64.3 | 66.2 | 76.2 | 75.2 | 74.8 | 70.7 | 65.0 | 50.6 | 40.9 | 61.8 |
| 1883 | 42.4 | 49.8 | 49.6 | 61.2 | 67.0 | 75.9 | 79.8 | 75.1 | 70.8 | 65.3 | 53.6 | 48.0 | 61.5 |
| 1884 | 35.7 | 51.0 | 54.2 | 58.1 | 70.9 | 70.8 | 76.0 | 75.1 | 74.9 | 67.8 | 51.6 | 45.1 | 61.1 |
| 1885 | 39.9 | 39.5 | 47.0 | 61.1 | 66.1 | 76.4 | 78.2 | 76.5 | 69.5 | 56.5 | 50.2 | 42.7 | 58.6 |
| 1886 | 36.1 | 41.9 | 50.1 | 60.4 | 68.1 | 72.3 | 73.8 | 76.1 | 72.9 | 62.3 | 50.6 | 40.7 | 58.9 |
| 1887 | 39.6 | 52.7 | 50.7 | 62.7 | 72.0 | 75.9 | 77.6 | 76.2 | 72.1 | 59.6 | 52.5 | 42.3 | 61.2 |
| 1888 | 45.0 | 49.0 | 50.6 | 64.1 | 68.1 | 74.8 | 79.2 | 78.5 | 68.8 | 58.2 | 52.4 | 43.5 | 61.0 |
| 1889 | 43.8 | 41.5 | 52.0 | 62.4 | 68.2 | 73.2 | 78.5 | 74.2 | 70.0 | 60.2 | 51.6 | 57.2 | 61.1 |
| 1890 | 51.0 | 54.8 | 49.6 | 62.2 | 69.0 | 78.8 | 78.2 | 75.2 | 71.6 | 59.6 | 57.6 | 45.4 | 62.8 |
| Mean | 42.9 | 46.5 | 52.0 | 60.9 | 68.6 | 73.1 | 79.1 | 76.6 | 71.1 | 61.1 | 51.4 | 44.1 | 60.8 |

Interpolated values are given in brackets.

*Mean temperature (degrees Fahr.) observed at Washington City by Signal Service observers and others.*

| Year. | January. | February. | March. | April. | May. | June. | July. | August. | September. | October. | November. | December. | Annual. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1820 | 28.9 | 41.7 | 45.8 | 56.5 | 62.4 | 71.5 | 78.1 | 75.3 | 67.0 | 51.2 | 42.1 | 34.2 | 54.6 |
| 1821 | 25.6 | 38.9 | 40.0 | 49.2 | 63.5 | 73.5 | 71.9 | 77.7 | 70.1 | 55.2 | 41.7 | 33.7 | 53.4 |
| 1823 | 41.1 | 35.0 | 47.2 | 61.1 | 67.3 | 72.4 | 77.8 | 76.8 | 68.8 | 53.8 | 39.9 | 37.7 | 56.6 |
| 1824 | 39.5 | 35.0 | 42.8 | 54.3 | 64.0 | 72.8 | 77.3 | 74.6 | 67.6 | 56.1 | 43.1 | 39.7 | 55.6 |
| 1825 | 35.1 | 38.9 | 48.7 | 56.0 | 64.3 | 75.6 | 78.6 | 75.4 | 67.1 | 59.8 | 44.4 | 35.8 | 56.6 |
| 1826 | 35.4 | 41.1 | 48.8 | 53.0 | 72.7 | 75.7 | 76.8 | 75.8 | 71.9 | 58.3 | 45.6 | 36.0 | 57.6 |
| 1827 | 29.9 | 42.4 | 47.2 | 59.6 | 65.5 | 73.6 | 79.2 | 78.0 | 69.8 | 58.0 | 44.7 | 41.3 | 57.4 |
| 1828 | 39.1 | 45.2 | 48.0 | 49.6 | 63.1 | 77.8 | 76.8 | 77.7 | 67.9 | 54.2 | 48.3 | 39.9 | 57.3 |
| 1829 | 32.2 | 38.9 | 41.5 | 56.0 | 64.2 | 74.0 | 73.8 | 74.6 | 64.8 | 53.6 | 43.4 | 43.9 | 54.2 |
| 1830 | 33.5 | 33.5 | 46.2 | 55.9 | 64.5 | 72.7 | 80.4 | 77.6 | 68.9 | 58.3 | 52.3 | 37.0 | 56.7 |
| 1831 | 26.5 | 29.1 | 46.6 | 54.7 | 62.6 | 73.1 | 74.3 | 74.4 | 67.0 | 55.6 | 41.9 | 25.1 | 52.6 |
| 1832 | 31.7 | 36.9 | 44.7 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| 1833 | 35.3 | 36.4 | 41.4 | 57.8 | 69.3 | 70.5 | 76.9 | 74.1 | 68.5 | 53.5 | 43.1 | 37.2 | 55.3 |
| 1834 | 29.5 | 43.0 | 47.2 | 55.4 | 62.1 | 71.6 | 79.8 | 76.8 | 66.0 | 52.9 | 43.6 | 36.2 | 55.3 |
| 1835 | 29.8 | 28.8 | 41.2 | 53.0 | 64.8 | 74.3 | 77.3 | 75.6 | 62.0 | 59.4 | 49.1 | 33.3 | 53.2 |
| 1838 | ..... | ..... | ..... | ..... | ..... | ..... | 83.5 | 80.8 | 69.8 | 51.8 | 40.0 | 30.2 | ..... |
| 1839 | 31.5 | 35.7 | 43.5 | 56.6 | 65.7 | 68.3 | 74.8 | 70.3 | 65.4 | 58.6 | 39.0 | 34.2 | 53.6 |
| 1840 | 23.9 | 39.6 | 45.3 | 56.4 | 63.8 | 70.9 | 75.3 | 75.5 | 62.9 | 56.0 | 43.2 | 30.3 | 53.6 |
| 1841 | 32.8 | 32.0 | 41.7 | 49.2 | 59.4 | 75.0 | 75.2 | 72.1 | 68.2 | 49.2 | 43.4 | 36.1 | 52.9 |
| 1842 | 36.7 | 39.3 | 50.6 | 56.3 | 61.6 | 71.6 | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| 1846 | 37.3 | 33.2 | 46.7 | 57.6 | 67.4 | 71.3 | 75.9 | 76.5 | 71.2 | 55.0 | 50.0 | 39.2 | 56.8 |
| 1847 | 33.9 | 37.1 | 41.8 | 56.6 | 63.4 | 71.4 | 76.3 | 73.1 | 66.8 | 53.8 | 48.4 | 39.5 | 55.2 |
| 1848 | 36.6 | 36.3 | 40.0 | 57.2 | 67.4 | 74.4 | 74.9 | 73.5 | 64.5 | 55.6 | 40.0 | 44.1 | 55.4 |
| 1849 | 32.6 | 33.6 | 44.3 | 52.8 | 66.3 | 75.9 | 76.5 | 76.0 | 69.8 | 58.6 | 48.9 | 34.6 | 55.8 |
| 1854 | 34.1 | 37.0 | 46.4 | 50.9 | 68.1 | 74.1 | 80.5 | 73.6 | 67.4 | 57.5 | 45.1 | 32.4 | 55.6 |
| 1855 | 34.8 | 26.8 | 41.4 | 53.3 | 63.5 | 70.4 | 78.3 | 74.5 | 69.7 | 53.5 | 46.1 | 36.8 | 54.4 |
| 1856 | 21.3 | 26.8 | 35.2 | 54.3 | 61.3 | 73.6 | 78.4 | 72.2 | 67.0 | 54.4 | 43.8 | 31.5 | 51.7 |
| 1857 | 21.5 | 41.8 | 38.8 | 44.9 | 60.6 | 70.8 | 74.0 | 73.2 | 67.4 | 54.2 | 42.1 | 34.8 | 52.0 |
| 1858 | 39.8 | 30.8 | 41.7 | 53.6 | 60.2 | 75.6 | 77.6 | 74.3 | 66.1 | 58.0 | 41.3 | 39.6 | 54.8 |
| 1859 | 36.0 | 39.2 | 49.4 | 51.8 | 64.2 | 70.6 | 75.4 | 73.8 | 66.8 | 51.3 | 47.9 | 33.5 | 55.0 |
| 1862 | 35.0 | 35.8 | 41.2 | 50.4 | 63.9 | 67.8 | 73.0 | 74.4 | 68.3 | 58.6 | 44.4 | 36.3 | 54.1 |
| 1863 | 37.2 | 35.2 | 37.7 | 48.5 | 64.1 | 69.4 | 75.0 | 77.0 | 64.0 | 53.8 | 46.6 | 35.3 | 53.6 |
| 1864 | 33.4 | 33.9 | 39.6 | 50.2 | 66.4 | 70.9 | 77.2 | 77.4 | 65.2 | 53.9 | 44.7 | 35.1 | 54.2 |
| 1865 | 27.8 | 32.7 | 48.0 | 53.0 | 63.7 | 75.1 | 75.8 | 73.4 | 72.8 | 54.7 | 45.4 | 37.7 | 55.0 |
| 1866 | 31.3 | 35.0 | 42.4 | 56.4 | 61.0 | 72.8 | 78.0 | 70.2 | 68.7 | 57.3 | 47.1 | 33.3 | 54.4 |
| 1867 | 24.4 | 39.0 | 37.8 | 54.8 | 58.7 | 70.6 | 75.2 | 73.1 | 67.8 | 55.9 | 47.3 | 31.8 | 53.0 |
| 1868 | 29.3 | 27.2 | 42.9 | 48.5 | 60.8 | 71.0 | 79.6 | 74.7 | 66.7 | 52.4 | 44.2 | 31.0 | 52.4 |
| 1869 | 38.1 | 38.4 | 39.9 | 52.3 | 59.7 | 71.2 | 75.1 | 75.3 | 67.2 | 49.6 | 38.9 | 37.1 | 53.6 |
| 1870 | 39.3 | 34.6 | 38.9 | 52.6 | 63.2 | 73.7 | 76.1 | 75.9 | 68.5 | 57.7 | 44.8 | 34.0 | 55.1 |
| 1871 | 32.6 | 35.9 | 48.0 | 58.2 | 63.9 | 73.2 | 74.0 | 76.8 | 62.3 | 58.1 | 42.3 | 32.1 | 54.8 |
| 1872 | 31.7 | 33.7 | 35.4 | 56.0 | 67.4 | 75.4 | 81.1 | 79.0 | 69.0 | 55.5 | 42.5 | 30.3 | 54.8 |
| 1873 | 30.9 | 34.8 | 41.8 | 53.1 | 63.6 | 75.1 | 79.8 | 74.8 | 68.0 | 54.9 | 40.8 | 40.5 | 54.8 |
| 1874 | 40.3 | 37.2 | 44.5 | 47.6 | 63.8 | 77.5 | 78.9 | 71.6 | 70.1 | 55.9 | 44.6 | 39.2 | 55.9 |
| 1875 | 29.5 | 28.8 | 39.1 | 48.0 | 63.6 | 72.9 | 77.0 | 71.9 | 64.6 | 53.6 | 41.0 | 36.8 | 52.2 |
| 1876 | 40.8 | 36.7 | 39.4 | 51.4 | 64.5 | 75.8 | 81.4 | 75.5 | 65.2 | 50.7 | 45.2 | 26.5 | 54.4 |
| 1877 | 39.4 | 39.4 | 41.0 | 52.9 | 61.9 | 73.9 | 77.8 | 76.3 | 66.9 | 58.6 | 46.2 | 41.8 | 55.5 |
| 1878 | 33.5 | 39.8 | 49.4 | 58.3 | 62.5 | 69.1 | 80.2 | 75.0 | 68.9 | 57.0 | 45.4 | 33.3 | 56.0 |
| 1879 | 30.8 | 31.6 | 43.5 | 51.8 | 65.3 | 72.9 | 78.6 | 73.9 | 64.4 | 62.0 | 45.6 | 41.1 | 55.1 |
| 1880 | 41.9 | 40.8 | 41.8 | 55.5 | 70.5 | 73.5 | 76.7 | 74.9 | 67.9 | 54.9 | 40.2 | 29.0 | 55.6 |
| 1881 | 27.6 | 32.8 | 40.1 | 50.3 | 67.0 | 70.7 | 77.4 | 76.5 | 77.0 | 62.9 | 47.5 | 41.7 | 56.0 |
| 1882 | 33.2 | 40.4 | 44.1 | 50.8 | 59.2 | 73.8 | 76.0 | 73.9 | 69.1 | 60.9 | 42.9 | 34.1 | 54.9 |
| 1883 | 29.6 | 37.5 | 37.6 | 50.9 | 63.6 | 74.4 | 76.8 | 72.1 | 65.1 | 56.9 | 47.2 | 36.9 | 54.1 |
| 1884 | 29.4 | 40.9 | 42.2 | 50.9 | 64.4 | 72.5 | 74.2 | 74.2 | 71.7 | 59.6 | 44.7 | 36.0 | 55.1 |
| 1885 | 32.9 | 26.9 | 34.5 | 53.1 | 62.3 | 71.1 | 77.8 | 73.4 | 66.1 | 54.7 | 45.3 | 37.5 | 53.0 |
| 1886 | 28.9 | 32.1 | 42.0 | 55.5 | 62.1 | 69.9 | 73.9 | 73.1 | 69.3 | 57.6 | 46.1 | 30.7 | 53.4 |
| 1887 | 32.9 | 38.9 | 38.5 | 51.6 | 67.9 | 72.1 | 80.5 | 73.2 | 65.0 | 55.4 | 44.9 | 37.2 | 54.8 |
| 1888 | 29.2 | 35.7 | 37.4 | 52.9 | 62.7 | 73.0 | 73.6 | 75.8 | 64.8 | 52.6 | 47.4 | 37.5 | 53.6 |
| 1889 | 39.2 | 31.1 | 43.4 | 54.4 | 64.6 | 70.8 | 75.8 | 72.4 | 65.6 | 52.5 | 46.2 | 45.6 | 55.1 |
| 1890 | 43.8 | 43.4 | 41.4 | 53.6 | 63.8 | 74.8 | 75.0 | 73.6 | 67.8 | 36.4 | 48.0 | 34.2 | 56.3 |
| Mean | 32.9 | 35.8 | 42.7 | 53.5 | 64.1 | 72.8 | 77.0 | 74.8 | 67.5 | 55.7 | 44.6 | 35.8 | 54.8 |

*Precipitation (in inches and hundredths) observed at Atlanta, Ga., by Dr. J. G. Westmoreland, F. Deckner & Son, U. S. Army surgeons, and Signal Service observers.*

| Year. | January. | February. | March. | April. | May. | June. | July. | August. | September. | October. | November. | December. | Annual. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1859 | 3.84 | 4.50 | 6.00 | 5.47 | 4.87 | 3.49 | 5.61 | 6.78 | 7.24 | 1.62 | 3.87 | 11.25 | 64.54 |
| 1865 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 4.53 | 8.66 | ..... |
| 1866 | 3.98 | 5.18 | 3.04 | 4.21 | 6.87 | 4.89 | 1.27 | 4.05 | [3.65] | [2.54] | 4.46 | 4.87 | 49.01 |
| 1867 | 1.70 | 1.47 | 5.74 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 4.84 | ..... |
| 1868 | 5.01 | 3.55 | 2.71 | 6.88 | 4.07 | 0.50 | 3.14 | 2.17 | [2.00] | 8.87 | 3.12 | 5.12 | 47.14 |
| 1869 | 5.31 | 9.93 | 5.85 | 8.67 | 1.75 | 2.48 | [4.00] | 2.12 | 2.31 | 1.87 | 6.03 | 6.69 | 57.01 |
| 1870 | 5.31 | 6.50 | [5.00] | 2.82 | 0.68 | 4.46 | 2.25 | 4.69 | 9.40 | 0.67 | 5.42 | 3.74 | 50.94 |
| 1871 | 2.03 | 6.20 | 6.01 | 5.20 | 7.77 | 5.97 | 1.12 | 6.49 | 4.44 | 2.09 | 3.41 | 3.36 | 54.09 |
| 1872 | 2.94 | 5.28 | 7.66 | 3.09 | 3.75 | 1.82 | 3.91 | 5.84 | 2.26 | 0.74 | 2.12 | 4.48 | 43.89 |
| 1873 | 3.36 | 12.04 | 2.58 | 1.96 | 6.05 | 7.06 | 3.87 | 2.08 | 5.40 | 1.23 | 3.15 | 2.41 | 51.19 |
| 1874 | 3.14 | 6.86 | 7.38 | 10.42 | 3.00 | 7.71 | 4.70 | 10.00 | 0.47 | 0.80 | 3.19 | 3.00 | 60.67 |
| 1875 | 5.60 | 6.92 | 10.27 | 4.79 | 1.77 | 3.98 | 4.04 | 3.02 | 4.24 | 2.08 | 3.76 | 3.75 | 54.22 |
| 1876 | 1.25 | 2.75 | 5.36 | 3.38 | 4.06 | 1.92 | 2.89 | 4.26 | 1.02 | 2.06 | 2.55 | 2.70 | 34.20 |
| 1877 | 9.08 | 2.10 | 7.75 | 6.36 | 0.88 | 4.85 | 1.32 | 1.00 | 2.99 | 3.74 | 3.22 | 3.52 | 46.81 |
| 1878 | 5.24 | 2.83 | 1.36 | 3.12 | 2.16 | 3.88 | 1.06 | 5.08 | 0.60 | 1.99 | 4.54 | 5.80 | 37.66 |
| 1879 | 4.29 | 3.09 | 2.49 | 3.96 | 4.16 | 3.20 | 5.75 | 4.76 | 1.43 | 5.44 | 3.88 | 7.84 | 50.31 |
| 1880 | 2.86 | 3.11 | 11.87 | 7.07 | 4.52 | 3.57 | 3.16 | 3.61 | 6.21 | 2.81 | 8.21 | 5.70 | 62.70 |
| 1881 | 8.35 | 10.41 | 10.98 | 4.58 | 1.27 | 2.46 | 0.56 | 4.10 | 3.76 | 3.44 | 4.30 | 7.53 | 61.74 |
| 1882 | 6.40 | 10.29 | 4.16 | 5.25 | 3.02 | 3.22 | 6.61 | 5.86 | 3.51 | 1.35 | 4.22 | 4.37 | 58.26 |
| 1883 | 15.82 | 3.22 | 3.73 | 8.20 | 2.00 | 2.31 | 1.06 | 2.73 | 1.38 | 1.52 | 4.72 | 4.84 | 51.53 |
| 1884 | 5.20 | 5.84 | 9.70 | 5.86 | 1.33 | 10.73 | 2.42 | 2.00 | 0.08 | 0.70 | 2.84 | 6.09 | 52.85 |
| 1885 | 8.44 | 4.14 | 4.26 | 1.31 | 6.12 | 4.83 | 4.02 | 6.92 | 6.51 | 3.94 | 3.98 | 2.64 | 57.11 |
| 1886 | 7.33 | 1.53 | 11.16 | 2.52 | 6.21 | 8.68 | 2.06 | 2.36 | 0.53 | 0.03 | 5.32 | 3.03 | 50.78 |
| 1887 | 3.52 | 3.74 | 1.99 | 1.38 | 1.76 | 2.82 | 14.11 | 7.51 | 4.20 | 3.28 | 0.30 | 5.79 | 50.40 |
| 1888 | 3.89 | 5.91 | 8.16 | 1.34 | 6.86 | 4.71 | 1.85 | 3.89 | 14.26 | 3.99 | 4.70 | 5.42 | 64.98 |
| 1889 | 6.39 | 5.28 | 2.49 | 2.54 | 3.16 | 5.03 | 8.83 | 6.73 | 6.32 | 2.21 | 5.17 | 0.60 | 54.75 |
| 1890 | 2.95 | 3.36 | 3.13 | 2.04 | 6.32 | 1.12 | 5.37 | 3.99 | 5.36 | 4.89 | 0.18 | 3.89 | 42.60 |
| Mean | 5.12 | 5.23 | 5.80 | 4.50 | 3.78 | 4.23 | 3.80 | 4.48 | 3.98 | 2.56 | 3.89 | 4.89 | 52.72 |

Interpolated values are given in brackets.

*Table of miscellaneous meteorological data for March, 1891—Signal Service observations.*

| Stations and districts. | Elevation above sea-level, feet. | Pressure, in inches: Mean actual. | Pressure: Mean reduced. | Pressure: Monthly range. | Temperature of air, in degrees Fahrenheit: Monthly mean. | Temp.: Departure from normal. | Temp.: Maximum. | Temp.: Mean maximum. | Temp.: Minimum. | Temp.: Mean minimum. | Temp.: Greatest daily range. | Temp.: Least daily range. | Mean temperature of the dew-point. | Mean relative humidity, per cent. | Precipitation, in inches. | Departure from normal precipitation. | Wind: Total movement, miles. | Wind: Prevailing direction. | Wind: Maximum velocity: Miles per hour. | Wind: Maximum velocity: Direction. | Wind: Maximum velocity: Date. | Cloudless days. | Partly cloudy days. | Cloudy days. | Days with rainfall. | Average cloudiness, tenths: 8 a. m. | Average cloudiness, tenths: 8 p. m. | Mean temperature data since opening of station: Length of record, years. | Highest for month. | Year. | Lowest for month. | Year. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *New England.* | | | | | 33.5 | + 0.3 | | | | | | | | | 4.24 | − 0.08 | | | | | | | | | | | | | | | | |
| Eastport | 53 | 30.02 | 30.08 | 1.11 | 29.0 | + 0.4 | 46 | 34.6 | 2 | 23.4 | 20 | 3 | 20.4 | 72.4 | 2.75 | − 2.25 | 10,739 | nw. | 42 | se. | 14 | 9 | 8 | 14 | 12 | 6.0 | 2.3 | 18 | 33.4 | 1881 | 22.8 | 1885 |
| Portland | 99 | 30.00 | 30.11 | 1.16 | 30.4 | − 0.4 | 53 | 36.7 | 2 | 24.0 | 24 | 2 | 19.6 | 68.2 | 5.48 | + 2.09 | 8,061 | nw. | 33 | e. | 21 | 13 | 8 | 10 | 13 | 5.0 | 4.0 | 20 | 38.8 | 1878 | 23.2 | 1872 |
| Manchester | 247 | 29.85 | 30.13 | 1.18 | 31.2 | ...... | 55 | 38.9 | 2 | 23.6 | 32 | 5 | 18.0 | 63.1 | 3.94 | + 0.94 | 5,834 | nw. | 28 | nw. | 5 | 15 | 5 | 11 | 15 | 5.3 | 5.3 | 5 | 35.6 | 1889 | 27.4 | 1887 |
| Northfield | 872 | 29.16 | 30.15 | 1.27 | 24.8 | ...... | 49 | 33.4 | −15 | 16.1 | 40 | 5 | 17.8 | 75.8 | 2.68 | ...... | 7,945 | s. | 60 | sw. | 13 | 7 | 11 | 13 | 15 | 6.0 | 5.9 | 5 | 29.5 | 1889 | 21.1 | 1887 |
| Boston † | 125 | 29.99 | 30.13 | 1.17 | 33.6 | − 0.1 | 55 | 40.0 | 3 | 27.3 | 24 | 2 | 24.5 | 72.8 | 5.63 | + 1.13 | 10,907 | nw. | 45 | s. | 10 | 11 | 6 | 14 | 14 | 5.2 | 5.0 | 21 | 41.5 | 1871 | 26.8 | 1872 |
| Nantucket | 14 | 30.08 | 30.09 | 1.00 | 34.9 | ...... | 54 | 39.6 | 16 | 30.2 | 17 | 3 | 29.3 | 80.0 | 1.86 | ...... | 12,694 | ne. | 50 | se. | 4 | 16 | 4 | 11 | 12 | 5.3 | 3.9 | 5 | 36.4 | 1889 | 32.4 | 1888 |
| Wood's Holl | 22 | ...... | ...... | .... | 34.4 | ...... | 52 | 40.5 | 9 | 28.4 | 21 | 4 | ...... | .... | 4.15 | − 0.69 | 13,177 | ne. | 62 | nw. | 4 | 13 | 8 | 10 | 7 | ... | 4.1 | 13 | 40.5 | 1878 | 31.6 | 1888 |
| Vineyard Haven | ...... | ...... | ...... | .... | 35.6 | ...... | 53 | 43.0 | 10 | 28.2 | 24 | 5 | ...... | .... | 3.63 | ...... | ...... | nw. | .... | ...... | ... | 11 | 7 | 13 | 10 | ... | ... | 3 | 38.6 | 1889 | 35.6 | 1891 |
| Block Island | 27 | 30.09 | 30.12 | 1.08 | 35.2 | + 0.2 | 59 | 40.2 | 9 | 30.1 | 21 | 4 | 28.4 | 78.2 | 2.42 | − 1.62 | 16,755 | ne. | 70 | ne. | 21 | 12 | 8 | 11 | 11 | 4.4 | 4.2 | 11 | 37.9 | 1882 | 29.8 | 1885 |
| Narragansett Pier | 22 | ...... | ...... | .... | 35.4 | + 3.0 | 53 | 43.3 | 4 | 27.5 | 25 | 6 | ...... | .... | 6.12 | + 1.73 | ...... | ne. | .... | ...... | ... | 6 | 15 | 10 | 11 | ... | ... | 3 | 36.8 | 1889 | 34.0 | 1890 |
| New Haven | 107 | 29.99 | 30.11 | 1.15 | 35.1 | + 0.7 | 63 | 42.5 | 3 | 27.7 | 22 | 5 | 25.6 | 73.7 | 3.68 | − 1.12 | 8,783 | ne. | 34 | ne. | 21 | 12 | 6 | 13 | 11 | 5.5 | 5.0 | 19 | 43.4 | 1878 | 26.9 | 1885 |
| New London | 47 | 30.05 | 30.10 | 1.12 | 35.6 | − 0.5 | 61 | 42.2 | 7 | 29.0 | 20 | 7 | 24.2 | 68.2 | 3.99 | − 0.94 | 7,904 | nw. | 48 | se. | 9 | 12 | 9 | 10 | 12 | 5.5 | 4.6 | 21 | 41.5 | 1878 | 26.7 | 1872 |
| *Mid. Atlantic States.* | | | | | 38.9 | − 2.2 | | | | | | | | | 6.08 | + 2.10 | | | | | | | | | | | | | | | | |
| Albany | 85 | 30.05 | 30.15 | 1.27 | 32.3 | − 0.7 | 60 | 40.3 | 2 | 24.3 | 26 | 6 | 26.0 | 78.6 | 3.12 | + 0.20 | 6,733 | nw. | 28 | se. | 9 | 6 | 13 | 12 | 15 | 5.8 | 4.7 | 18 | 38.8 | 1882 | 23.1 | 1885 |
| New York City | 185 | 29.90 | 30.10 | 1.04 | 37.8 | + 0.6 | 61 | 44.7 | 9 | 30.8 | 21 | 7 | 26.5 | 72.6 | 4.22 | + 0.12 | 11,254 | ne. | 45 | sw. | 14 | 5 | 11 | 15 | 13 | 6.0 | 5.6 | 21 | 43.8 | 1878 | 28.9 | 1872 |
| Harrisburg | 377 | 29.70 | 30.13 | 0.98 | 35.0 | ...... | 53 | 41.1 | 10 | 28.8 | 26 | 3 | 25.0 | 71.4 | 4.25 | + 0.58 | 7,316 | ne. | 36 | nw. | 13 | 11 | 4 | 16 | 15 | 6.1 | 5.9 | 3 | 40.8 | 1889 | 35.0 | 1891 |
| Philadelphia | 117 | 29.98 | 30.11 | 1.03 | 38.0 | − 2.0 | 61 | 45.2 | 12 | 30.9 | 26 | 6 | 26.4 | 69.8 | 4.42 | + 1.27 | 10,734 | ne. | 37 | ne. | 22 | 7 | 8 | 16 | 15 | 6.6 | 6.4 | 21 | 48.6 | 1871 | 30.8 | 1885 |
| Atlantic City | 53 | 30.04 | 30.09 | 1.06 | 37.0 | − 0.8 | 55 | 42.4 | 14 | 31.5 | 25 | 4 | 30.1 | 78.4 | 3.32 | − 0.60 | 11,466 | ne. | 44 | ne. | 28 | 11 | 7 | 13 | 14 | 4.3 | 4.5 | 18 | 43.6 | 1878 | 31.4 | 1885 |
| New Brunswick | ...... | ...... | ...... | .... | 36.3 | ...... | 61 | 44.0 | 8 | 28.6 | 28 | 6 | ...... | .... | 4.89 | ...... | ...... | ne. | .... | ...... | ... | 3 | 14 | 14 | 13 | ... | ... | .... | ...... | .... | ...... | .... |
| Baltimore | 76 | 30.03 | 30.12 | 1.08 | 38.6 | − 3.5 | 60 | 44.5 | 16 | 32.6 | 26 | 3 | 28.8 | 72.4 | 7.94 | + 3.85 | 6,033 | ne. | 26 | ne. | 27 | 11 | 5 | 15 | 18 | 5.8 | 5.8 | 21 | 49.1 | 1878 | 35.3 | 1885 |
| Washington City | 112 | 29.99 | 30.11 | 1.08 | 38.6 | − 2.8 | 60 | 44.7 | 17 | 32.4 | 27 | 3 | 28.2 | 72.8 | 8.84 | + 4.64 | 6,813 | ne. | 34 | n. | 22 | 12 | 1 | 18 | 15 | 6.5 | 6.4 | 21 | 49.4 | 1878 | 34.5 | 1885 |
| Cape Henry | ...... | ...... | ...... | .... | 43.2 | − 1.9 | 68 | 49.7 | 25 | 36.8 | 32 | 6 | ...... | .... | 9.20 | + 3.79 | ...... | ne. | .... | ...... | ... | 7 | 6 | 18 | 16 | ... | ... | 17 | 52.4 | 1878 | 39.4 | 1885 |
| Lynchburgh | 685 | 29.36 | 30.12 | 0.99 | 40.6 | − 5.2 | 64 | 47.3 | 19 | 33.9 | 34 | 4 | 29.6 | 71.1 | 7.44 | + 3.59 | 4,152 | e. | 34 | n. | 22 | 5 | 9 | 17 | 16 | 7.0 | 6.3 | 20 | 53.8 | 1878 | 39.0 | * |
| Norfolk | 43 | 30.03 | 30.07 | 1.16 | 43.6 | − 3.4 | 74 | 50.7 | 23 | 36.5 | 34 | 3 | 36.4 | 80.0 | 8.09 | + 3.51 | 7,754 | nw. | 48 | nw. | 22 | 11 | 3 | 17 | 18 | 5.3 | 5.6 | 21 | 55.1 | 1871 | 40.8 | 1885 |
| *S. Atlantic States.* | | | | | 52.1 | − 2.1 | | | | | | | | | 6.15 | + 1.71 | | | | | | | | | | | | | | | | |
| Charlotte | 808 | 29.21 | 30.07 | 0.89 | 45.8 | − 5.0 | 70 | 53.7 | 23 | 37.8 | 29 | 4 | 36.8 | 77.8 | 11.13 | + 6.37 | 4,245 | nw. | 25 | w. | 22 | 8 | 6 | 17 | 17 | 5.6 | 5.5 | 13 | 54.6 | 1879 | 45.3 | 1885 |
| Hatteras | 11 | ...... | ...... | .... | 49.2 | − 0.5 | 68 | 56.1 | 30 | 42.4 | 22 | 5 | ...... | .... | 5.07 | − 1.36 | ...... | ...... | .... | ...... | ... | ... | ... | ... | 13 | ... | ... | 11 | 53.3 | 1884 | 44.4 | 1885 |
| Kitty Hawk | 9 | 30.03 | 30.04 | 1.18 | 46.7 | − 0.9 | 72 | 53.5 | 26 | 39.9 | 28 | 4 | 40.0 | 81.0 | 5.33 | − 0.59 | 13,552 | ne. | 54 | e. | 21 | 3 | 12 | 16 | 20 | 6.7 | 5.6 | 15 | 53.1 | 1878 | 41.7 | 1885 |
| Raleigh | 388 | 29.66 | 30.09 | 0.98 | 45.2 | − 3.5 | 72 | 52.7 | 22 | 37.7 | 32 | 3 | 34.8 | 72.8 | 7.25 | ...... | 5,530 | n. | 26 | nw. | 22 | 5 | 5 | 21 | 18 | 7.0 | 6.6 | 5 | 49.6 | 1890 | 45.2 | 1891 |
| Southport | ...... | ...... | ...... | .... | 52.1 | + 0.2 | 69 | 59.4 | 29 | 44.8 | 24 | 5 | ...... | .... | 4.83 | + 0.76 | ...... | * | .... | ...... | ... | 5 | 11 | 15 | 12 | ... | ... | 16 | 58.4 | 1878 | 45.8 | 1885 |
| Wilmington | 78 | 29.98 | 30.07 | 1.04 | 52.2 | − 1.5 | 72 | 59.8 | 30 | 44.7 | 28 | 8 | 44.6 | 81.0 | 5.15 | + 0.98 | 7,023 | ne. | 41 | nw. | 22 | 3 | 13 | 15 | 12 | 6.7 | 5.8 | 21 | 60.3 | 1871 | 48.0 | 1872 |
| Charleston | 52 | 30.00 | 30.05 | 0.88 | 55.1 | − 1.6 | 74 | 62.2 | 34 | 48.0 | 28 | 6 | 50.7 | 90.3 | 5.47 | + 1.46 | 6,420 | ne. | 36 | ne. | 26 | 5 | 6 | 20 | 12 | 5.1 | 5.7 | 21 | 62.5 | 1871 | 52.1 | 1872 |
| Columbia | ...... | ...... | ...... | .... | b47.6 | ...... | b70 | b55.9 | b26 | b39.4 | 28b | b3 | ...... | .... | 6.99 | ...... | ...... | nw. | .... | ...... | ... | 10 | 5 | 16 | 13 | ... | ... | 4 | 54.2 | 1890 | 47.6 | 1891 |
| Augusta | 183 | 29.89 | 30.08 | 0.88 | 52.0 | − 4.1 | 79 | 60.6 | 30 | 43.5 | 32 | 2 | 42.0 | 76.0 | 8.44 | + 3.25 | 3,452 | ne. | 20 | w. | 9 | 9 | 8 | 14 | 16 | 6.2 | 5.7 | 20 | 61.3 | 1878 | 49.5 | 1885 |
| Savannah | 87 | 29.96 | 30.06 | 0.84 | 56.1 | − 2.7 | 78 | 63.3 | 35 | 48.9 | 26 | 5 | 46.8 | 77.2 | 5.08 | + 1.43 | 6,414 | nw. | 35 | nw. | 6 | 7 | 12 | 12 | 14 | 5.7 | 5.0 | 21 | 64.1 | 1880 | 53.1 | 1872 |
| Jacksonville | 43 | 30.00 | 30.05 | 0.79 | 61.6 | − 0.4 | 82 | 70.1 | 38 | 53.2 | 25 | 6 | 50.8 | 75.2 | 4.02 | + 0.76 | 6,175 | ne. | 34 | sw. | 12 | 5 | 14 | 12 | 13 | 6.5 | 4.3 | 20 | 68.1 | 1880 | 57.6 | 1885 |
| *Florida Peninsula.* | | | | | | | | | | | | | | | 2.58 | + 0.48 | | | | | | | | | | | | | | | | |
| Jupiter | 28 | 30.01 | 30.04 | 0.54 | 69.6 | ...... | 84 | 77.0 | 51 | 62.1 | 23 | 6 | 62.3 | 80.0 | 1.19 | ...... | 7,473 | s. | 25 | s. | 7 | 17 | 9 | 5 | 7 | 3.9 | 2.8 | 4 | 69.6 | 1891 | 64.8 | 1889 |
| Key West | 22 | 30.03 | 30.05 | 0.40 | 72.8 | + 0.3 | 81 | 76.6 | 64 | 68.9 | 12 | 4 | 63.8 | 74.4 | 1.93 | + 0.77 | 7,281 | se. | 33 | n. | 14 | 17 | 9 | 5 | 4 | 4.1 | 2.6 | 21 | 76.6 | 1874 | 69.4 | 1889 |
| Micco k | ...... | ...... | ...... | .... | 67.8 | ...... | 88 | 78.1 | 48 | 57.4 | 31 | 9 | ...... | .... | 0.43 | ...... | ...... | sw. | .... | ...... | ... | 10 | 3 | 7 | 2 | ... | ... | 3 | 67.8 | 1891 | 63.4 | 1889 |
| Tampa | 36 | 30.01 | 30.05 | 0.54 | 66.2 | ...... | 82 | 75.1 | 46 | 57.4 | 27 | 9 | 58.4 | 83.4 | 3.24 | + 0.18 | 4,973 | w. | 25 | se. | 26 | 10 | 13 | 8 | 8 | 4.3 | 3.9 | .... | ...... | .... | ...... | .... |
| Titusville | 44 | 30.01 | 30.05 | 0.58 | 65.4 | ...... | 84 | 73.4 | 46 | 57.4 | 27 | 3 | 59.0 | 85.0 | 4.43 | ...... | 9,207 | w. | 37 | n. | 10 | 17 | 8 | 6 | 8 | 3.4 | 3.1 | 4 | 65.4 | 1891 | 61.5 | 1889 |
| *Eastern Gulf States.* | | | | | 56.1 | − 2.4 | | | | | | | | | 7.83 | + 1.63 | | | | | | | | | | | | | | | | |
| Atlanta | 1,139 | 28.84 | 30.06 | 0.79 | 47.0 | − 5.4 | 73 | 54.6 | 23 | 39.4 | 34 | 4 | 39.8 | 81.8 | 10.16 | + 3.98 | 6,630 | nw. | 36 | nw. | 21 | 8 | 9 | 14 | 19 | 5.7 | 5.8 | 13 | 57.0 | * | 47.0 | * |
| Pensacola | 56 | 29.96 | 30.02 | 0.65 | 59.4 | − 1.1 | 77 | 65.9 | 39 | 52.9 | 19 | 7 | 52.0 | 81.8 | 6.94 | + 1.50 | 7,934 | ne. | 32 | nw. | 13 | 11 | 12 | 8 | 11 | 5.7 | 3.6 | 12 | 65.4 | 1880 | 54.8 | 1885 |
| Auburn | ...... | ...... | ...... | .... | 52.8 | ...... | 73 | 61.6 | 28 | 42.9 | 31 | 0 | ...... | .... | 6.96 | ...... | ...... | nw. | .... | ...... | ... | 13 | 8 | 10 | 8 | ... | ... | 3 | 54.0 | 1889 | 52.8 | 1891 |
| Mobile | 35 | 29.99 | 30.03 | 0.70 | 58.8 | − 0.7 | 78 | 66.6 | 38 | 50.9 | 22 | 8 | 51.1 | 84.6 | 6.96 | − 0.43 | 6,710 | s. | 33 | n. | 13 | 2 | 14 | 15 | 16 | 6.3 | 5.7 | 21 | 65.1 | 1882 | 53.5 | 1885 |
| Montgomery | 217 | 29.82 | 30.05 | 0.73 | 55.2 | − 2.3 | 78 | 64.2 | 32 | 46.3 | 31 | 5 | 45.1 | 75.4 | 9.73 | + 3.61 | 5,184 | e. | 28 | se. | 7 | 7 | 7 | 17 | 15 | 6.9 | 5.8 | 19 | 62.6 | 1878 | 51.7 | 1885 |
| Meridian | 358 | 29.65 | 30.04 | 0.75 | 54.5 | ...... | 80 | 63.6 | 30 | 45.4 | 36 | 6 | 41.8 | 70.2 | 10.59 | ...... | 4,784 | e. | 28 | w. | 21 | 10 | 10 | 11 | 11 | 5.9 | 4.7 | 2 | 54.5 | 1891 | 54.0 | 1890 |
| Vicksburg | 222 | 29.76 | 30.00 | 0.88 | 55.4 | − 3.1 | 81 | 64.3 | 33 | 46.5 | 31 | 6 | 44.0 | 71.8 | 10.51 | + 4.14 | 5,568 | se. | 33 | nw. | 12 | 11 | 9 | 11 | 10 | 5.6 | 5.8 | 20 | 64.6 | 1878 | 53.9 | 1876 |
| University | ...... | ...... | ...... | .... | 49.6 | ...... | 76 | 59.7 | 25 | 39.4 | 35 | 7 | ...... | .... | 11.10 | ...... | ...... | n. | .... | ...... | ... | 0 | 24 | 7 | 14 | ... | ... | 4 | 53.6 | 1889 | 49.6 | 1891 |
| New Orleans | 54 | 29.97 | 30.03 | 0.75 | 60.6 | − 1.9 | 80 | 67.4 | 39 | 53.8 | 24 | 2 | 50.4 | 76.0 | 2.67 | − 3.01 | 7,748 | ne. | 36 | ne. | 16 | 11 | 9 | 11 | 8 | 6.1 | 5.3 | 21 | 67.9 | 1882 | 58.4 | 1885 |
| Port Eads | ...... | ...... | ...... | .... | 60.7 | ...... | 77 | 71.3 | 44 | 50.1 | 32 | 10 | ...... | .... | 3.22 | ...... | ...... | ne. | .... | ...... | ... | ... | ... | ... | 5 | ... | ... | 3 | 65.1 | 1890 | 60.2 | 1889 |
| *Western Gulf States.* | | | | | 53.6 | − 5.2 | | | | | | | | | 3.06 | − 0.34 | | | | | | | | | | | | | | | | |
| Shreveport | 249 | 29.73 | 29.99 | 0.85 | 53.8 | − 4.7 | 78 | 63.6 | 30 | 44.1 | 31 | 6 | 42.4 | 72.2 | 3.11 | − 1.61 | 6,412 | se. | 30 | nw. | 21 | 9 | 8 | 14 | 12 | 6.4 | 6.2 | 20 | 65.3 | 1879 | 53.8 | * |
| Fort Smith | 492 | 29.50 | 30.03 | 0.78 | 45.1 | − 6.5 | 76 | 55.6 | 18 | 34.6 | 40 | 4 | 34.3 | 70.6 | 4.32 | + 1.49 | 6,480 | e. | 30 | w. | 20 | 10 | 8 | 13 | 14 | 6.2 | 5.2 | 9 | 54.4 | 1887 | 45.1 | 1891 |
| Little Rock | 309 | 29.68 | 30.02 | 0.91 | 47.0 | − 6.6 | 70 | 54.6 | 23 | 39.3 | 34 | 4 | 41.1 | 82.8 | 5.48 | + 0.57 | 5,440 | ne. | 27 | w. | 21 | 8 | 8 | 15 | 12 | 7.1 | 5.4 | 12 | 58.9 | 1882 | 47.0 | 1891 |
| Corpus Christi | 20 | 29.97 | 29.99 | 0.82 | 60.0 | − 4.0 | 80 | 66.2 | 37 | 53.7 | 23 | 4 | 52.8 | 79.4 | 2.18 | + 0.52 | 9,085 | se. | 47 | ne. | 15 | 1 | 7 | 23 | 8 | 7.7 | 6.8 | 5 | 65.4 | 1887 | 60.0 | 1891 |
| Galveston | 44 | 29.97 | 30.01 | 0.80 | 59.5 | − 3.0 | 74 | 64.9 | 37 | 54.1 | 19 | 4 | 55.0 | 85.6 | 2.55 | − 0.62 | 9,722 | se. | 38 | n. | 13 | 8 | 8 | 15 | 12 | 6.5 | 6.6 | 20 | 68.2 | 1879 | 59.0 | 1886 |
| Palestine | 511 | 29.48 | 30.04 | 0.76 | 52.6 | − 6.6 | 80 | 62.8 | 26 | 42.5 | 38 | 4 | 41.8 | 72.8 | 2.63 | − 1.66 | 6,074 | nw. | 26 | s. | 2 | 5 | 14 | 12 | 10 | 6.2 | 5.8 | 10 | 64.3 | 1882 | 52.6 | 1891 |
| San Antonio | 781 | 29.19 | 30.02 | 0.78 | 57.3 | − 4.9 | 85 | 67.6 | 29 | 47.0 | 37 | 3 | 40.3 | 60.8 | 1.18 | − 1.04 | 7,082 | ne. | 36 | sw. | 23 | 7 | 13 | 11 | 5 | 6.4 | 5.3 | 14 | 70.2 | 1879 | 56.6 | 1888 |
| *Rio Grande Valley.* | | | | | 65.7 | − 3.4 | | | | | | | | | 1.40 | + 0.02 | | | | | | | | | | | | | | | | |
| Brownsville | 57 | 29.89 | 29.95 | 0.82 | 65.8 | − 2.5 | 88 | 73.8 | 42 | 57.9 | 26 | 5 | 57.6 | 83.0 | 1.80 | + 0.29 | 7,551 | s. | 46 | s. | 3 | 5 | 12 | 14 | 10 | 7.0 | 6.4 | 14 | 71.2 | 1879 | 65.4 | 1888 |
| Rio Grande City | 230 | 29.76 | 30.01 | 0.82 | 65.6 | − 4.4 | 94 | 75.7 | 39 | 55.4 | 36 | 3 | 53.7 | 75.2 | 0.99 | − 0.25 | 5,263 | ne. | 36 | n. | 7 | 5 | 14 | 12 | 6 | 7.3 | 6.3 | 12 | 74.5 | 1879 | 64.2 | 1888 |
| *Ohio Val. & Tenn.* | | | | | 41.5 | − 3.6 | | | | | | | | | 6.43 | + 2.03 | | | | | | | | | | | | | | | | |
| Chattanooga | 783 | 29.22 | 30.07 | 0.81 | 47.6 | − 3.4 | 69 | 56.0 | 24 | 39.3 | 33 | 4 | 37.7 | 75.1 | 9.16 | + 2.79 | 4,913 | s. | 30 | nw. | 13 | 6 | 11 | 14 | 21 | 7.8 | 5.5 | 13 | 55.1 | 1882 | 45.6 | 1885 |
| Knoxville | 980 | 29.01 | 30.07 | 0.84 | 45.6 | − 2.7 | 71 | 53.0 | 21 | 38.3 | 31 | 5 | 36.3 | 73.9 | 7.87 | + 2.21 | 4,057 | ne. | 26 | w. | 13 | 5 | 10 | 16 | 19 | 8.1 | 5.2 | 21 | 54.3 | 1878 | 40.9 | 1872 |
| Memphis | 330 | 29.68 | 30.05 | 0.87 | 48.0 | − 4.5 | 76 | 55.4 | 26 | 40.5 | 28 | 4 | 40.0 | 79.8 | 7.37 | + 1.61 | 6,697 | n. | 38 | w. | 21 | 11 | 5 | 15 | 14 | 6.3 | 6.6 | 21 | 59.3 | 1878 | 47.0 | 1872 |
| Nashville | 553 | 29.45 | 30.04 | 0.87 | 46.1 | − 2.9 | 67 | 54.0 | 20 | 38.2 | 28 | 3 | 36.2 | 74.4 | 10.31 | + 5.09 | 4,949 | nw. | 30 | nw. | 21 | 4 | 10 | 17 | 15 | 6.6 | 6.0 | 21 | 55.9 | 1878 | 41.8 | 1885 |
| Lexington | ...... | ...... | ...... | ... | 40.4 | ...... | 67 | 47.3 | 15 | 33.5 | 32 | 3 | 33.9 | 82.7 | 7.63 | ...... | 11,556 | nw. | 50 | nw. | 8 | 7 | 7 | 17 | 18 | 6.9 | 6.9 | 4 | 45.8 | 1889 | 38.6 | 1890 |
| Louisville | 551 | 29.44 | 30.04 | 0.91 | 41.7 | − 4.2 | 69 | 49.7 | 16 | 33.7 | 31 | 4 | 30.2 | 70.1 | 6.57 | + 2.39 | 7,014 | ne. | 30 | sw. | 21 | 7 | 5 | 19 | 16 | 6.1 | 7.3 | 20 | 52.4 | 1878 | 38.8 | 1872 |
| Indianapolis | 766 | 29.20 | 30.04 | 0.92 | 35.5 | − 4.4 | 65 | 42.1 | 8 | 28.9 | 29 | 3 | 26.8 | 74.9 | 5.77 | + 1.81 | 6,109 | ne. | 30 | nw. | 4 | 4 | 6 | 21 | 21 | 7.1 | 7.1 | 21 | 49.9 | 1878 | 33.0 | 1885 |
| Cincinnati | 628 | 29.38 | 30.07 | 0.97 | 37.9 | − 4.9 | 66 | 44.7 | 13 | 31.1 | 28 | 4 | 28.6 | 73.1 | 4.86 | + 1.37 | 6,654 | ne. | 26 | s. | 13 | 5 | 9 | 17 | 17 | 6.9 | 6.2 | 21 | 51.4 | 1878 | 32.2 | 1885 |
| Columbus | 837 | 29.14 | 30.08 | 1.02 | 34.8 | − 4.0 | 63 | 41.4 | 6 | 28.3 | 29 | 3 | 26.4 | 75.0 | 4.64 | + 1.40 | 7,183 | e. | 34 | w. | 4 | 7 | 6 | 18 | 17 | 7.4 | 5.5 | 13 | 44.2 | 1882 | 29.6 | 1885 |
| Pittsburgh | 847 | 29.16 | 30.10 | 1.21 | 37.6 | − 1.7 | 65 | 45.5 | 11 | 29.8 | 30 | 6 | 27.8 | 71.6 | 3.11 | + 0.24 | 5,582 | se. | 42 | sw. | 13 | 6 | 7 | 18 | 17 | 6.5 | 6.6 | 21 | 47.3 | 1871 | 30.7 | 1872 |
| Parkersburgh | 638 | 29.36 | 30.08 | 1.18 | 38.8 | ...... | 66 | 47.1 | 10 | 30.4 | 33 | 4 | 31.8 | 80.4 | 4.66 | + 1.39 | 4,938 | w. | 30 | nw. | 14 | 8 | 4 | 19 | 19 | 6.8 | 6.9 | 3 | 38.8 | 1891 | 36.7 | 1890 |
| *Lower Lake Region.* | | | | | 31.4 | − 1.0 | | | | | | | | | 2.86 | + 0.15 | | | | | | | | | | | | | | | | |
| Buffalo | 690 | 29.31 | 30.08 | 1.04 | 31.0 | + 1.2 | 54 | 38.2 | 4 | 23.7 | 25 | 4 | 22.1 | 71.4 | 2.14 | − 0.57 | 9,091 | ne. | 60 | sw. | 13 | 4 | 13 | 14 | 18 | 7.4 | 6.5 | 21 | 40.9 | 1871 | 19.7 | 1885 |
| Oswego | 335 | 29.72 | 30.10 | 1.15 | 29.3 | − 0.4 | 52 | 34.8 | 1 | 23.8 | 25 | 2 | 21.7 | 75.6 | 4.15 | + 1.43 | 10,347 | se. | 41 | sw. | 13 | 6 | 7 | 18 | 14 | 7.3 | 6.9 | 21 | 41.9 | 1878 | 18.7 | 1885 |
| Rochester | 523 | 29.52 | 30.11 | 1.12 | 31.0 | + 0.8 | 60 | 37.7 | 6 | 24.3 | 28 | 6 | 24.2 | 78.4 | 4.44 | + 1.47 | 7,334 | nw. | 48 | w. | 13 | 3 | 15 | 13 | 21 | 7.0 | 6.5 | 21 | 40.1 | 1878 | 20.0 | 1885 |
| Erie | 714 | 29.27 | 30.06 | 1.07 | 32.6 | − 0.4 | 58 | 40.9 | 7 | 24.4 | 37 | 4 | 25.4 | 80.6 | 2.44 | − 0.51 | 10,418 | ne. | 38 | sw. | 15 | 5 | 5 | 21 | 19 | 7.7 | 7.0 | 18 | 42.2 | 1878 | 25.0 | 1885 |
| Cleveland | 751 | 29.25 | 30.10 | 1.06 | 32.4 | − 0.9 | 60 | 38.7 | 11 | 26.2 | 28 | 3 | 25.0 | 77.2 | 2.93 | + 0.03 | 6,939 | ne. | 34 | se. | 27 | 6 | 7 | 18 | 13 | 7.5 | 6.9 | 21 | 43.1 | 1871 | 24.4 | 1885 |
| Sandusky | 629 | 29.38 | 30.08 | 0.99 | 32.3 | − 2.0 | 60 | 38.7 | 8 | 25.9 | 28 | 5 | 24.8 | 78.8 | 2.27 | − 0.33 | 7,683 | e. | 36 | n. | 13 | 1 | 5 | 25 | 15 | 7.6 | 6.8 | 14 | 43.6 | 1878 | 27.0 | 1885 |
| Toledo | 674 | 29.35 | 30.09 | 1.00 | 32.0 | − 2.8 | 56 | 38.2 | 8 | 25.7 | 27 | 3 | 24.8 | 79.4 | 2.27 | + 0.13 | 8,618 | ne. | 36 | ne. | 26 | 9 | 6 | 16 | 16 | 6.8 | 6.6 | 21 | 46.0 | 1878 | 28.1 | 1885 |
| Detroit | 724 | 29.28 | 30.09 | 1.01 | 30.8 | − 3.1 | 52 | 36.9 | 6 | 24.6 | 23 | 3 | 23.2 | 78.8 | 2.23 | − 0.19 | 9,193 | ne. | 42 | sw. | 15 | 5 | 9 | 17 | 13 | 7.5 | 7.0 | 21 | 41.1 | 1878 | 25.6 | 1872 |
| *Upper Lake Region.* | | | | | 25.8 | − 1.0 | | | | | | | | | 2.90 | + 0.81 | | | | | | | | | | | | | | | | |
| Alpena | 609 | 29.41 | 30.10 | 0.96 | 25.4 | + 1.8 | 48 | 30.7 | − 8 | 20.0 | 27 | 2 | 20.4 | 82.0 | 3.47 | + 1.42 | 8,327 | e. | 42 | e. | 31 | 6 | 9 | 16 | 16 | 6.4 | 5.2 | 19 | 35.3 | 1878 | 13.1 | 1885 |
| Escanaba | ...... | ...... | ...... | .... | 22.6 | + 2.2 | 57 | 33.9 | −22 | 11.3 | 40 | 4 | ...... | .... | 2.83 | + 1.04 | ...... | n. | .... | ...... | ... | 11 | 8 | 12 | 14 | ... | ... | 20 | 35.3 | 1878 | 14.0 | 1885 |
| Grand Haven | 621 | 29.35 | 30.05 | 1.05 | 29.8 | − 1.4 | 57 | 36.2 | 4 | 23.3 | 31 | 4 | 21.4 | 75.6 | 2.48 | + 0.13 | 9,996 | e. | 43 | sw. | 9 | 4 | 4 | 23 | 14 | 8.3 | 7.1 | 20 | 42.6 | 1878 | 23.4 | * |
| Lansing | 883 | 29.12 | 30.12 | 1.02 | 29.4 | ...... | 56 | 36.7 | − 1 | 22.0 | 30 | 4 | 20.7 | 75.4 | 2.69 | + 0.19 | 6,704 | ne. | 28 | sw. | 15 | 6 | 7 | 18 | 19 | 6.9 | 6.6 | 5 | 37.0 | 1889 | 26.6 | 1888 |
| Manistee | 615 | 29.37 | 30.08 | 1.08 | 28.2 | ...... | 56 | 34.1 | 3 | 22.2 | 29 | 1 | 20.8 | 76.6 | 2.92 | ...... | 6,732 | e. | 29 | nw. | 4 | 7 | 7 | 17 | 17 | 7.1 | 5.3 | 3 | 33.1 | 1889 | 25.4 | 1890 |
| Marquette | 735 | 29.26 | 30.08 | 1.11 | 21.8 | − 0.6 | 46 | 29.5 | − 6 | 14.2 | 32 | 5 | 14.4 | 74.7 | 4.45 | + 2.97 | 5,535 | nw. | 36 | se. | 30 | 10 | 9 | 12 | 18 | 6.5 | 5.5 | 20 | 39.9 | 1878 | 12.0 | 1885 |
| Port Huron | 639 | 29.39 | 30.11 | 1.00 | 28.3 | − 0.6 | 50 | 33.7 | 6 | 22.9 | 30 | 3 | 20.8 | 75.4 | 2.18 | − 0.80 | 10,479 | n. | 51 | s. | 15 | 8 | 5 | 18 | 15 | 7.2 | 6.3 | 17 | 39.7 | 1878 | 18.6 | 1885 |
| Sault de Ste. Marie | 642 | 29.37 | 30.10 | 1.02 | 21.6 | ...... | 55 | 30.1 | −14 | 13.2 | 32 | 4 | 16.4 | 83.2 | 2.49 | + 1.26 | 7,235 | se. | 42 | se. | 31 | 6 | 8 | 17 | 15 | 6.0 | 5.9 | 3 | 28.7 | 1889 | 17.8 | 1890 |
| Chicago | 824 | 29.14 | 30.06 | 0.96 | 30.6 | − 3.7 | 57 | 36.2 | 7 | 25.1 | 32 | 0 | 25.2 | 84.0 | 2.13 | − 0.43 | 14,319 | ne. | 56 | sw. | 15 | 2 | 12 | 17 | 15 | 7.8 | 7.2 | 21 | 44.3 | 1878 | 27.6 | 1872 |
| Milwaukee | 699 | 29.27 | 30.05 | 1.04 | 28.8 | − 1.4 | 50 | 34.2 | 4 | 23.3 | 32 | 4 | 22.7 | 79.0 | 3.17 | + 0.65 | 9,862 | ne. | 37 | se. | 30 | 5 | 8 | 18 | 14 | 7.2 | 7.0 | 21 | 40.2 | 1878 | 23.3 | 1877 |
| Green Bay | 616 | 29.39 | 30.09 | 1.13 | 24.0 | ...... | 42 | 31.5 | − 2 | 16.5 | 36 | 4 | 18.1 | 81.6 | 3.33 | ...... | 6,016 | n. | 36 | e. | 30 | 7 | 9 | 15 | 14 | 6.7 | 5.3 | 5 | 34.0 | 1889 | 20.3 | 1888 |
| Duluth | 672 | 29.32 | 30.09 | 1.10 | 19.5 | − 4.4 | 38 | 26.5 | −12 | 12.5 | 27 | 4 | 13.3 | 78.0 | 3.13 | + 1.67 | 4,825 | ne. | 30 | ne. | 30 | 8 | 12 | 11 | 15 | 5.1 | 5.2 | 21 | 39.4 | 1878 | 14.8 | 1872 |

*Table of miscellaneous meteorological data for March*, 1891—*Signal Service observations*—Continued.

| Stations and districts. | Elevation above sea-level, feet. | Pressure, in inches. Mean actual. | Mean reduced. | Monthly range. | Temperature of air, in degrees Fahrenheit. Monthly mean. | Departure from normal. | Maximum. | Mean maximum. | Minimum. | Mean minimum. | Greatest daily range. | Least daily range. | Mean temperature of the dew-point. | Mean relative humidity, per cent. | Precipitation, in inches. | Departure from normal precipitation. | Wind. Total movement, miles. | Prevailing direction. | Maximum velocity. Miles per hour. | Direction. | Date. | Cloudless days. | Partly cloudy days. | Cloudy days. | Days with rainfall. | Average cloudiness, tenths. 8 a. m. | 8 p. m. | Mean temperature data since opening of station. Length of record, years. | Highest for month. | Year. | Lowest for month. | Year. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Extreme Northwest.* | | | | | 16.0 | — 5.6 | | | | | | | | | 1.11 | + 0.46 | | | | | | | | | | | | | | | | |
| Moorhead | 935 | 29.03 | 30.12 | 1.03 | 13.7 | — 6.8 | 48 | 23.9 | —23 | 3.5 | 41 | 5 | 9.4 | 87.5 | 1.46 | + 0.72 | 7,116 | n. | 36 | se. | 14 | 14 | 7 | 10 | 10 | 4.9 | 9.4 | 11 | 32.6 | 1889 | 12.3 | 1888 |
| Saint Vincent | 804 | 29.20 | 30.14 | 0.93 | 11.6 | — 1.6 | 46 | 23.5 | —29 | — 0.4 | 38 | 11 | ..... | .... | 1.23 | + 0.68 | 6,314 | n. | 36 | se. | 16 | 12 | 11 | 8 | 8 | 5.6 | 3.4 | 11 | 30.4 | 1889 | 7.8 | 1888 |
| Bismarck | 1,681 | 26.22 | 30.12 | 1.05 | 15.6 | — 8.6 | 50 | 23.4 | —33 | 5.7 | 54 | 5 | 12.5 | 92.2 | 1.24 | + 0.22 | 7,252 | n. | 36 | nw. | 10 | 14 | 6 | 11 | 8 | 4.6 | 5.6 | 17 | 40.2 | 1876 | 12.2 | 1876 |
| Fort Buford | 1,900 | 27.96 | 30.07 | 1.16 | 18.4 | — 6.3 | 58 | 29.8 | —32 | 7.2 | 43 | 5 | 12.4 | 82.2 | 0.27 | — 0.13 | 6,218 | sw. | 48 | nw. | 10 | 4 | 9 | 18 | 8 | 6.9 | 7.0 | 13 | 35.2 | 1889 | 13.1 | 1888 |
| Fort Yates | ..... | ..... | ..... | ..... | 20.6 | — 4.5 | 58 | 31.9 | —26 | 9.2 | 36 | 8 | ..... | .... | 1.37 | + 0.82 | ..... | nw. | .... | ..... | ... | 9 | 8 | 14 | 11 | ... | ... | 7 | 38.4 | 1889 | 20.6 | 1891 |
| *Upper Miss. Valley.* | | | | | 31.4 | — 5.4 | | | | | | | | | 2.84 | + 0.36 | | | | | | | | | | | | | | | | |
| Minneapolis | ..... | ..... | ..... | ..... | 25.0 | ..... | 49 | 33.2 | — 5 | 16.7 | 32 | 6 | ..... | .... | 1.42 | ..... | ..... | ne. | .... | ..... | ... | 8 | 6 | 17 | 12 | ... | ... | .... | ..... | .... | ..... | .... |
| Red Wing | 758 | 29.22 | 30.09 | 1.09 | 23.4 | ..... | 47 | 31.3 | —11 | 15.4 | 34 | 4 | 17.1 | 80.3 | 2.37 | ..... | 5,876 | e. | 38 | sw. | 15 | 7 | 10 | 14 | 10 | 7.1 | 6.0 | ..... | ..... | .... | ..... | .... |
| Saint Paul | 831 | 29.13 | 30.06 | 1.09 | 23.5 | — 5.0 | 48 | 30.9 | — 9 | 16.1 | 30 | 2 | 15.6 | 74.0 | 0.94 | — 0.45 | 5,381 | nw. | 36 | ne. | 29 | 9 | 5 | 17 | 10 | 6.4 | 6.4 | 20 | 44.3 | 1878 | 18.2 | 1888 |
| La Crosse | 736 | 29.26 | 30.08 | 1.09 | 26.9 | — 3.8 | 53 | 35.3 | — 8 | 18.5 | 38 | 4 | 17.4 | 73.9 | 2.58 | + 0.96 | 4,157 | ne. | 26 | e. | 29 | 8 | 8 | 15 | 10 | 6.4 | 6.8 | 19 | 46.9 | 1878 | 22.2 | 1888 |
| Davenport | 613 | 29.39 | 30.08 | 0.98 | 28.8 | — 6.1 | 58 | 35.0 | 1 | 22.6 | 33 | 3 | 22.4 | 78.9 | 1.68 | — 0.50 | 8,971 | ne. | 38 | se. | 30 | 4 | 7 | 20 | 17 | 7.4 | 6.9 | 20 | 48.2 | 1878 | 28.7 | 1877 |
| Des Moines | 869 | 29.09 | 30.04 | 0.94 | 28.8 | — 6.2 | 60 | 36.6 | — 5 | 21.1 | 29 | 4 | 22.7 | 81.4 | 2.25 | + 0.87 | 8,177 | ne. | 30 | se. | 29 | 7 | 10 | 14 | 13 | 8.4 | 6.2 | 13 | 42.2 | 1889 | 28.8 | 1891 |
| Dubuque | 651 | 29.32 | 30.06 | 1.03 | 27.7 | — 5.5 | 54 | 34.4 | — 1 | 21.0 | 38 | 2 | 21.2 | 80.0 | 2.69 | + 0.41 | 5,039 | ne. | 25 | e. | 29 | 7 | 5 | 19 | 12 | 7.4 | 6.6 | 18 | 45.4 | 1878 | 26.7 | 1888 |
| Keokuk | 613 | 29.36 | 30.05 | 0.90 | 31.1 | — 6.8 | 65 | 38.1 | — 1 | 24.1 | 33 | 3 | 25.2 | 79.4 | 2.27 | + 0.10 | 5,902 | nw. | 25 | w. | 31 | 5 | 7 | 19 | 15 | 7.5 | 6.4 | 20 | 50.4 | 1878 | 31.1 | 1891 |
| Cairo | 359 | 29.65 | 30.04 | 0.91 | 42.8 | — 4.3 | 64 | 48.8 | 17 | 36.7 | 23 | 1 | 34.9 | 78.0 | 5.86 | + 2.02 | 8,304 | ne. | 40 | w. | 21 | 7 | 6 | 18 | 19 | 6.8 | 7.2 | 20 | 57.6 | 1878 | 42.5 | * |
| Springfield, Ill. | 644 | 29.32 | 30.02 | 0.92 | 33.8 | — 6.1 | 65 | 41.3 | 2 | 26.2 | 37 | 4 | 26.8 | 80.2 | 3.21 | + 0.62 | 8,814 | w. | 36 | sw. | 10 | 5 | 8 | 18 | 15 | 7.1 | 6.8 | 12 | 44.3 | 1882 | 33.8 | 1891 |
| Saint Louis | 571 | 29.40 | 30.03 | 0.90 | 39.0 | — 4.8 | 68 | 45.9 | 9 | 32.0 | 31 | 4 | 31.1 | 79.2 | 2.29 | — 0.76 | 10,249 | n. | 37 | sw. | 10 | 8 | 7 | 16 | 13 | 6.4 | 6.2 | 21 | 53.9 | 1878 | 37.8 | 1872 |
| *Missouri Valley.* | | | | | 27.8 | — 8.4 | | | | | | | | | 2.17 | + 0.58 | | | | | | | | | | | | | | | | |
| Columbia | ..... | ..... | ..... | ..... | 37.0 | ..... | 69 | 46.7 | 0 | 27.3 | 35 | 5 | ..... | .... | 3.43 | ..... | 7,022 | nw. | 30 | s | 10 | 3 | 5 | 23 | 14 | ... | 7.3 | ..... | ..... | .... | ..... | .... |
| Kansas City | 963 | 28.98 | 30.06 | 0.86 | 33.9 | — 8.4 | 64 | 41.6 | 2 | 20.2 | 33 | 4 | 27.6 | 81.4 | 3.82 | + 1.81 | 7,766 | nw. | 30 | s. | 15 | 6 | 12 | 13 | 14 | 6.7 | 5.5 | 3 | 45.4 | 1889 | 33.9 | 1891 |
| Springfield, Mo. | 1,350 | 28.54 | 30.02 | 0.72 | 39.5 | — 5.5 | 68 | 48.2 | 9 | 30.8 | 30 | 3 | 27.8 | 71.6 | 1.47 | — 1.88 | 7,949 | se. | 38 | nw. | 21 | 8 | 9 | 14 | 13 | 6.5 | 6.1 | 6 | 50.6 | 1882 | 39.5 | 1891 |
| Leavenworth | 842 | 29.14 | 30.05 | 0.89 | 34.2 | — 7.5 | 68 | 41.8 | 1 | 26.6 | 33 | 3 | 26.2 | 77.4 | 3.16 | + 0.92 | 6,419 | nw. | 30 | se. | 29 | 6 | 8 | 17 | 13 | 6.4 | 6.0 | 20 | 50.6 | 1878 | 34.2 | 1891 |
| Topeka | ..... | ..... | ..... | ..... | 35.0 | ..... | 72 | 45.1 | — 1 | 24.8 | 38 | 5 | ..... | .... | 2.49 | ..... | ..... | n. | .... | ..... | ... | 7 | 14 | 10 | 10 | ... | ... | 4 | 44.9 | 1889 | 35.0 | 1891 |
| Omaha | 1,113 | 28.85 | 30.08 | 0.93 | 28.6 | — 7.9 | 62 | 35.6 | — 6 | 21.6 | 26 | 3 | 21.6 | 79.8 | 2.26 | + 0.79 | 7,263 | nw. | 34 | nw. | 21 | 4 | 10 | 17 | 13 | 6.9 | 5.9 | 21 | 47.9 | 1878 | 27.6 | 1881 |
| Crete | ..... | ..... | ..... | ..... | 30.0 | ..... | 64 | 38.6 | — 6 | 21.5 | 30 | 5 | ..... | .... | 2.37 | ..... | ..... | n. | .... | ..... | ... | 10 | 6 | 15 | 13 | ... | ... | 4 | 42.6 | 1889 | 29.2 | 1888 |
| Valentine | 2,613 | 27.25 | 30.14 | 0.79 | 21.6 | —11.9 | 55 | 31.5 | —26 | 11.8 | 49 | 3 | 14.3 | 78.0 | 2.58 | + 1.51 | 8,315 | nw. | 36 | nw. | 20 | 11 | 6 | 14 | 13 | 4.1 | 5.2 | 6 | 44.0 | 1889 | 21.6 | 1891 |
| Sioux City | 1,138 | 28.78 | 30.10 | 0.97 | 25.6 | ..... | 53 | 32.4 | —14 | 17.7 | 28 | 3 | 18.3 | 80.0 | 2.01 | ..... | 7,566 | nw. | 31 | se. | 16 | 9 | 4 | 18 | 10 | 5.9 | 6.1 | 2 | 28.4 | 1890 | 23.0 | 1891 |
| Fort Sully | 1,600 | 28.31 | 30.08 | 0.93 | 22.0 | — 8.3 | 56 | 30.7 | —24 | 13.3 | 37 | 4 | 16.4 | 84.1 | 0.65 | — 0.03 | 8,828 | nw. | 38 | n. | 30 | 8 | 8 | 15 | 10 | 7.3 | 5.8 | 11 | 38.0 | 1889 | 15.9 | 1876 |
| Huron | 1,307 | 28.62 | 30.09 | 0.90 | 19.3 | — 9.7 | 50 | 28.0 | —24 | 10.6 | 39 | 3 | 13.3 | 81.6 | 1.64 | + 0.99 | 8,947 | nw. | 35 | ne. | 30 | 6 | 10 | 15 | 12 | 6.0 | 6.0 | 10 | 36.3 | 1889 | 19.2 | 1888 |
| Yankton | 1,232 | 28.72 | 30.11 | 0.93 | 23.0 | — 7.6 | 49 | 31.0 | —17 | 15.1 | 33 | 2 | 17.0 | 82.4 | 1.75 | + 0.50 | 7,404 | nw. | 32 | nw. | 21 | 7 | 20 | 13 | 10 | 6.0 | 6.5 | 18 | 43.5 | 1878 | 20.0 | 1876 |
| *Northern Slope.* | | | | | 24.7 | — 9.4 | | | | | | | | | 1.84 | + 1.03 | | | | | | | | | | | | | | | | |
| Ft. Assinniboine | 2,690 | 27.10 | 30.02 | 0.86 | 20.2 | — 9.7 | 58 | 29.5 | —34 | 11.0 | 38 | 7 | 15.8 | 83.2 | 0.15 | — 0.45 | 7,555 | sw. | 50 | w. | 9 | 6 | 6 | 19 | 9 | 5.9 | 6.1 | 11 | 39.6 | 1885 | 18.6 | 1888 |
| Fort Custer | 3,040 | 26.77 | 30.02 | 0.81 | 25.0 | — 9.8 | 61 | 35.4 | —30 | 14.7 | 41 | 4 | 18.7 | 83.8 | 0.60 | + 0.03 | 5,401 | se. | 36 | n. | 20 | 6 | 12 | 13 | 6 | 5.8 | 6.0 | 11 | 40.6 | 1889 | 23.0 | 1888 |
| Helena | 4,069 | 25.78 | 30.06 | 0.74 | 23.2 | —10.8 | 54 | 30.5 | —20 | 15.8 | 27 | 4 | 12.5 | 66.7 | 1.37 | + 0.75 | 4,697 | sw. | 48 | sw. | 21 | 8 | 11 | 12 | 10 | 5.6 | 5.0 | 11 | 40.6 | 1885 | 23.2 | * |
| Rapid City | 3,280 | 26.36 | 30.10 | 0.90 | 25.1 | ..... | 64 | 34.9 | —17 | 15.3 | 41 | 4 | 14.8 | 73.0 | 1.96 | + 1.14 | 6,154 | nw. | 42 | nw. | 20 | 6 | 12 | 13 | 14 | 6.2 | 6.0 | 4 | 39.8 | 1889 | 24.9 | 1888 |
| Cheyenne | 6,105 | 23.84 | 29.97 | 0.54 | 27.7 | — 7.3 | 56 | 38.5 | — 4 | 16.9 | 44 | 7 | 13.2 | 64.4 | 1.61 | + 0.99 | 9,135 | nw. | 46 | nw. | 9 | 8 | 10 | 13 | 12 | 4.9 | 6.1 | 21 | 42.1 | 1887 | 25.7 | 1875 |
| Fort McKinney | 5,000 | 24.91 | 30.12 | 0.70 | 20.7 | ..... | 60 | 37.3 | —14 | 16.1 | 36 | 5 | 18.8 | 74.7 | 1.06 | ..... | 7,960 | n. | 50 | nw. | 21 | 6 | 13 | 12 | 9 | 5.1 | 6.8 | 4 | 41.2 | 1889 | 22.7 | 1888 |
| Fort Washakie | 5,580 | 24.32 | 30.02 | 0.62 | 24.4 | ..... | 53 | 36.8 | — 8 | 12.0 | 42 | 11 | 14.8 | 70.5 | 3.58 | + 3.21 | 4,135 | sw. | 40 | w. | 20 | 13 | 11 | 7 | 10 | 4.0 | 5.3 | 6 | 37.9 | 1889 | 24.4 | 1891 |
| North Platte | 2,841 | 27.04 | 30.08 | 0.62 | 27.5 | — 9.5 | 68 | 38.9 | — 6 | 16.1 | 43 | 4 | 17.8 | 76.2 | 2.19 | + 1.57 | 8,065 | nw. | 34 | nw. | 30 | 10 | 12 | 9 | 8 | 5.1 | 5.4 | 17 | 44.6 | 1878 | 26.9 | 1888 |
| *Middle Slope.* | | | | | 33.7 | — 7.8 | | | | | | | | | 2.21 | + 1.70 | | | | | | | | | | | | | | | | |
| Denver | 5,281 | 24.63 | 29.99 | 0.61 | 32.2 | — 7.9 | 68 | 43.2 | 4 | 21.3 | 38 | 4 | 14.0 | 57.6 | 3.10 | + 2.22 | 5,665 | ne. | 36 | ne. | 3 | 10 | 11 | 10 | 14 | 4.6 | 6.6 | 20 | 46.0 | 1879 | 32.2 | 1891 |
| Pueblo | 4,734 | 25.14 | 30.01 | 0.59 | 35.8 | — 6.2 | 70 | 48.5 | 6 | 23.2 | 44 | 6 | 13.0 | 51.0 | 1.37 | + 0.86 | 5,782 | e. | 44 | nw. | 20 | 8 | 15 | 8 | 9 | 4.5 | 5.5 | 3 | 44.2 | 1889 | 35.8 | 1891 |
| Concordia | 1,410 | 28.53 | 30.09 | 0.82 | 33.1 | — 6.4 | 70 | 42.2 | — 2 | 24.0 | 36 | 4 | 24.9 | 82.2 | 3.72 | + 1.76 | 7,229 | n. | 30 | w. | 30 | 11 | 12 | 8 | 12 | 4.7 | 4.8 | 6 | 44.1 | 1889 | 33.1 | 1891 |
| Dodge City | 2,523 | 27.32 | 30.06 | 0.67 | 33.8 | — 9.4 | 68 | 44.2 | 4 | 23.5 | 38 | 3 | 24.1 | 77.4 | 3.32 | + 2.51 | 10,156 | nw. | 37 | s. | 14 | 9 | 15 | 7 | 9 | 4.8 | 4.7 | 17 | 48.8 | 1878 | 33.8 | 1891 |
| Wichita | 1,366 | 28.52 | 30.03 | 0.85 | 37.8 | ..... | 68 | 46.9 | 6 | 28.6 | 32 | 3 | 27.4 | 73.2 | 3.36 | ..... | 9,377 | n. | 39 | n. | 18 | 7 | 10 | 14 | 10 | 5.6 | 6.3 | 3 | 46.5 | 1889 | 37.8 | 1891 |
| Fort Reno | ..... | ..... | ..... | ..... | 44.2 | ..... | 80 | 59.6 | 14 | 28.8 | 56 | 5 | ..... | .... | 2.52 | + 1.16 | ..... | s. | .... | ..... | ... | 23 | 0 | 8 | 2 | ... | ... | 3 | 50.2 | 1890 | 44.2 | 1891 |
| Oklahoma City | 1,239 | 28.68 | 30.04 | 0.81 | 43.6 | ..... | 81 | 54.2 | 14 | 32.9 | 40 | 3 | 33.2 | 76.2 | 3.04 | ..... | 9,160 | n. | 48 | n. | 3 | 9 | 14 | 8 | 8 | 5.2 | 4.3 | ..... | ..... | .... | ..... | .... |
| *Southern Slope.* | | | | | 47.5 | — 6.3 | | | | | | | | | 1.81 | + 0.52 | | | | | | | | | | | | | | | | |
| Fort Sill ‡ | 1,200 | 28.72 | 29.99 | 0.82 | 45.4 | — 6.2 | 83 | 57.3 | 16 | 33.5 | 49 | 2 | 32.2 | 71.2 | 2.66 | + 1.43 | 8,690 | n. | 48 | n. | 3 | 10 | 13 | 8 | 4 | 4.4 | 3.8 | 14 | 58.9 | 1878 | 45.4 | 1891 |
| Abilene | 1,748 | 28.16 | 30.00 | 0.74 | 49.6 | — 6.4 | 88 | 60.5 | 17 | 38.8 | 44 | 3 | 33.2 | 63.0 | 1.79 | + 0.24 | 9,908 | s. | 48 | s. | 10 | 12 | 13 | 6 | 6 | 3.8 | 3.8 | 6 | 59.1 | 1887 | 49.6 | 1891 |
| Fort Stanton | 6,152 | 23.83 | 29.78 | 0.54 | 41.5 | ..... | 69 | 53.7 | 11 | 29.3 | 41 | 13 | 12.4 | 41.2 | 0.98 | — 0.11 | 4,153 | sw. | 36 | sw. | 28 | 8 | 16 | 7 | 9 | 3.6 | 5.3 | 6 | 46.6 | 1890 | 38.9 | 1888 |
| *Southern Plateau.* | | | | | 50.7 | — 1.4 | | | | | | | | | 0.43 | — 0.57 | | | | | | | | | | | | | | | | |
| El Paso | 3,796 | 26.10 | 29.88 | 0.60 | 54.5 | — 1.8 | 78 | 67.1 | 21 | 41.9 | 40 | 12 | 25.5 | 41.1 | 0.16 | — 0.33 | 7,728 | nw. | 42 | w. | 6 | 14 | 6 | 11 | 4 | 4.5 | 4.8 | 13 | 63.6 | 1879 | 52.9 | 1886 |
| Carthage | ..... | ..... | ..... | ..... | 48.0 | ..... | 76 | 63.7 | 18 | 32.3 | 44 | 22 | ..... | .... | 0.40 | ..... | ..... | nw. | .... | ..... | ... | 14 | 12 | 5 | 4 | ... | ... | .... | ..... | .... | ..... | .... |
| Santa Fé | 7,026 | 23.13 | 29.94 | 0.53 | 36.4 | — 3.6 | 63 | 46.4 | 9 | 26.3 | 35 | 7 | 17.8 | 53.5 | 0.89 | — 0.03 | 5,740 | sw. | 40 | nw. | 20 | 11 | 12 | 8 | 10 | 4.5 | 5.5 | 19 | 47.5 | 1879 | 32.4 | 1880 |
| Fort Apache | ..... | ..... | ..... | ..... | 45.7 | + 0.7 | 72 | 61.0 | 15 | 30.4 | 41 | 18 | ..... | .... | 1.08 | — 0.61 | ..... | sw. | .... | ..... | ... | 10 | 12 | 9 | 6 | ... | ... | 13 | 50.6 | 1879 | 41.6 | 1881 |
| Fort Bowie | ..... | ..... | ..... | ..... | 49.9 | — 2.3 | 71 | 59.4 | 25 | 40.4 | 34 | 10 | ..... | .... | 0.64 | — 1.60 | ..... | sw. | .... | ..... | ... | 19 | 7 | 5 | 6 | ... | ... | 6 | 56.9 | 1887 | 48.2 | 1888 |
| Fort Grant | 4,860 | 25.12 | 29.95 | 0.48 | 49.8 | — 2.5 | 73 | 60.0 | 22 | 39.6 | 30 | 10 | 31.7 | 53.9 | 0.28 | — 0.81 | 5,281 | nw. | 26 | w. | 28 | 13 | 12 | 6 | 7 | 3.1 | 5.0 | 13 | 60.7 | 1879 | 47.5 | 1886 |
| Fort Thomas | ..... | ..... | ..... | ..... | 53.4 | — 0.6 | 80 | 68.2 | 26 | 35.5 | 39 | 8 | ..... | .... | 0.40 | — 0.78 | ..... | nw. | .... | ..... | ... | 10 | 10 | 11 | 5 | ... | ... | 11 | 58.8 | 1887 | 49.2 | 1886 |
| Holbrook | ..... | ..... | ..... | ..... | 44.4 | ..... | 72 | 58.4 | 1 | 30.3 | 36 | 18 | ..... | .... | 1.13 | ..... | ..... | w. | .... | ..... | ... | 14 | 11 | 6 | 8 | ... | ... | .... | ..... | .... | ..... | .... |
| San Carlos | ..... | ..... | ..... | ..... | 53.5 | — 1.1 | 79 | 67.0 | 28 | 40.0 | 34 | 14 | ..... | .... | 0.51 | — 0.81 | ..... | sw. | .... | ..... | ... | 22 | 7 | 2 | 2 | ... | ... | 6 | 59.6 | 1887 | 51.4 | 1888 |
| Willcox | ..... | ..... | ..... | ..... | 49.7 | + 0.3 | 80 | 67.0 | 23 | 33.4 | 50 | 16 | ..... | .... | 0.46 | — 0.45 | ..... | w. | .... | ..... | ... | 12 | 6 | 13 | 2 | ... | ... | 6 | 54.0 | 1887 | 46.0 | 1888 |
| Yuma | 141 | 29.77 | 29.91 | 0.58 | 63.4 | — 1.7 | 87 | 76.1 | 42 | 50.6 | 36 | 14 | 34.6 | 42.2 | T. | — 0.18 | 6,165 | w. | 48 | w. | 22 | 21 | 8 | 2 | 0 | 2.2 | 2.8 | 16 | 71.8 | 1877 | 58.3 | 1880 |
| Keeler | 3,622 | 26.26 | 29.90 | 0.61 | 50.3 | ..... | 74 | 61.3 | 30 | 39.3 | 29 | 10 | 27.0 | 44.5 | 0.16 | — 0.15 | 6,381 | nw. | 54 | nw. | 18 | 13 | 8 | 10 | 4 | 2.8 | 4.4 | 7 | 56.5 | 1887 | 47.5 | 1886 |
| *Middle Plateau.* | | | | | 37.6 | — 3.8 | | | | | | | | | 2.23 | + 1.16 | | | | | | | | | | | | | | | | |
| Carson City | ..... | ..... | ..... | ..... | 41.3 | ..... | 64 | 51.1 | 20 | 31.2 | 32 | 8 | ..... | .... | 2.50 | ..... | ..... | ..... | .... | ..... | ... | 12 | 14 | 5 | 8 | 4.9 | 4.9 | 4 | 44.8 | 1889 | 40.6 | 1890 |
| Winnemucca | 4,340 | 25.62 | 30.05 | 0.50 | 38.4 | — 2.6 | 62 | 47.8 | 12 | 29.0 | 36 | 9 | 20.6 | 53.6 | 0.90 | + 0.04 | 7,858 | sw. | 48 | sw. | 27 | 4 | 16 | 11 | 13 | 6.1 | 7.0 | 13 | 47.2 | 1883 | 32.6 | 1880 |
| Fort Du Chesne | 4,900 | 24.93 | 29.93 | 0.56 | 35.4 | ..... | 62 | 48.3 | 11 | 22.6 | 41 | 12 | 19.8 | 60.5 | 1.24 | ..... | 4,742 | sw. | 48 | w. | 2 | 7 | 14 | 10 | 7 | 5.5 | 5.7 | 4 | 42.5 | 1889 | 35.2 | 1888 |
| Salt Lake City | 4,348 | 25.58 | 30.01 | 0.61 | 38.0 | — 4.0 | 64 | 45.9 | 12 | 30.2 | 28 | 7 | 26.0 | 63.8 | 4.66 | + 2.74 | 3,300 | nw. | 25 | sw. | 21 | 7 | 16 | 8 | 15 | 5.0 | 5.4 | 17 | 49.6 | 1879 | 33.7 | 1880 |
| Taylor's Ranch | ..... | ..... | ..... | ..... | 33.7 | ..... | 58 | 46.9 | 1 | 20.5 | 36 | 15 | ..... | .... | 2.15 | ..... | ..... | w. | .... | ..... | ... | 17 | 12 | 2 | 7 | ... | ... | 2 | 37.5 | 1890 | 33.7 | 1891 |
| Montrose | 5,795 | 24.16 | 29.91 | 0.56 | 36.0 | — 4.7 | 67 | 45.5 | 11 | 26.5 | 36 | 7 | 20.2 | 57.8 | 1.14 | + 0.70 | 4,735 | se. | 45 | n. | 20 | 9 | 13 | 9 | 14 | 5.9 | 6.3 | 7 | 43.5 | * | 33.1 | 1886 |
| *Northern Plateau.* | | | | | | | | | | | | | | | 1.10 | — 0.36 | | | | | | | | | | | | | | | | |
| Baker City | 3,430 | 26.45 | 30.08 | 0.52 | 31.6 | ..... | 53 | 42.2 | — 6 | 21.1 | 34 | 8 | 19.8 | 66.0 | 1.40 | ..... | 3,874 | nw. | 24 | nw. | 23 | 4 | 14 | 13 | 9 | 7.0 | 5.6 | 2 | 37.6 | 1890 | 31.6 | 1891 |
| Spokane Falls | 1,938 | 27.98 | 30.11 | 0.72 | 33.4 | — 6.3 | 56 | 43.1 | —10 | 23.6 | 35 | 4 | 21.2 | 67.8 | 1.03 | — 0.33 | 3,775 | sw. | 36 | sw. | 9 | 7 | 11 | 13 | 13 | 4.4 | 5.8 | 11 | 46.8 | 1889 | 33.4 | 1891 |
| Walla Walla | 1,018 | 29.02 | 30.14 | 0.66 | 39.3 | ..... | 61 | 47.1 | 2 | 31.5 | 25 | 8 | 29.4 | 73.6 | 1.16 | — 0.40 | 3,954 | sw. | 40 | sw. | 21 | 5 | 14 | 12 | 12 | 5.9 | 6.5 | 6 | 53.0 | 1889 | 39.3 | 1891 |
| *N. Pac. Coast Region* | | | | | 44.8 | — 2.3 | | | | | | | | | 5.58 | — 0.63 | | | | | | | | | | | | | | | | |
| Fort Canby | 179 | 29.88 | 30.08 | 0.90 | 43.8 | — 1.6 | 55 | 49.1 | 31 | 38.5 | 20 | 6 | 41.6 | 93.5 | 5.98 | 0.00 | 8,424 | se. | 56 | se. | 20 | 4 | 13 | 14 | 24 | 6.3 | 7.6 | 8 | 51.2 | 1889 | 43.8 | 1891 |
| Neah Bay | ..... | ..... | ..... | ..... | 42.5 | ..... | 56 | 49.6 | 22 | 35.4 | 23 | 7 | ..... | .... | 9.80 | + 1.72 | ..... | se. | .... | ..... | ... | 10 | 2 | 19 | 16 | ... | ... | 7 | 49.6 | 1889 | 42.5 | 1891 |
| Olympia | 36 | 30.04 | 30.08 | 0.78 | 42.6 | — 2.1 | 63 | 50.4 | 21 | 34.7 | 29 | 5 | 37.6 | 85.4 | 3.04 | — 2.16 | 2,779 | s. | 17 | w. | 30 | 9 | 7 | 15 | 18 | 5.2 | 6.1 | 14 | 49.8 | 1889 | 39.5 | 1880 |
| Port Angeles | 14 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | .... | ..... | ..... | ..... | ..... | ..... | ..... | ... | ..... | ..... | ..... | ..... | ... | ... | 7 | 45.6 | 1889 | 39.7 | 1886 |
| Tatoosh Island | ..... | ..... | ..... | ..... | 42.4 | — 1.7 | 53 | 46.7 | 30 | 38.1 | 14 | 5 | ..... | .... | 8.67 | + 0.58 | ..... | e. | .... | ..... | ... | 6 | 10 | 15 | 21 | ... | ... | 7 | 47.5 | 1885 | 41.0 | 1890 |
| Astoria | ..... | ..... | ..... | ..... | 44.4 | ..... | 56 | 50.7 | 27 | 38.0 | 21 | 6 | ..... | .... | 5.40 | — 1.41 | ..... | sw. | .... | ..... | ... | 6 | 8 | 17 | 25 | ... | ... | 5 | 51.8 | 1889 | 44.4 | * |
| Portland | 80 | 30.01 | 30.10 | 0.78 | 44.0 | — 4.5 | 60 | 51.8 | 23 | 36.3 | 28 | 8 | 36.0 | 76.4 | 2.06 | — 3.96 | 3,740 | s. | 28 | s. | 26 | 6 | 14 | 11 | 16 | 6.5 | 7.0 | 20 | 53.8 | 1889 | 41.2 | 1880 |
| Roseburgh | 523 | 29.56 | 30.12 | 0.61 | 47.0 | — 1.7 | 66 | 54.0 | 31 | 39.9 | 34 | 5 | 38.4 | 75.8 | 4.13 | + 0.85 | 2,666 | e. | 27 | sw. | 26 | 4 | 4 | 23 | 19 | 8.0 | 7.8 | 14 | 52.7 | 1889 | 40.1 | 1880 |
| *Mid. Pac. Coast Reg.* | | | | | 50.3 | + 0.2 | | | | | | | | | 1.72 | — 1.59 | | | | | | | | | | | | | | | | |
| Eureka | 64 | 30.06 | 30.12 | 0.50 | 49.0 | ..... | 60 | 54.1 | 34 | 43.8 | 19 | 4 | 46.2 | 92.0 | 5.83 | ..... | 5,835 | nw. | 39 | n. | 30 | 5 | 7 | 19 | 16 | 5.9 | 6.9 | 5 | 52.2 | 1889 | 46.9 | 1890 |
| Red Bluffs | 342 | 29.70 | 30.05 | 0.49 | 55.0 | — 0.1 | 78 | 64.7 | 38 | 45.4 | 32 | 9 | 43.0 | 69.6 | 1.42 | — 1.94 | 5,300 | nw. | 30 | n. | 23 | 10 | 7 | 11 | 11 | 4.1 | 6.0 | 14 | 61.0 | 1885 | 50.3 | 1880 |
| Sacramento | 64 | 29.97 | 30.04 | 0.42 | 56.0 | + 0.2 | 76 | 63.6 | 40 | 48.5 | 27 | 7 | 44.4 | 69.5 | 1.78 | — 1.50 | 6,141 | nw. | 33 | nw. | 23 | 15 | 10 | 6 | 10 | 2.9 | 3.7 | 14 | 59.1 | 1885 | 48.8 | 1880 |
| San Francisco | 109 | 29.96 | 30.08 | 0.34 | 55.0 | + 0.5 | 76 | 62.2 | 43 | 47.8 | 25 | 7 | 46.8 | 81.4 | 1.96 | — 1.32 | 5,864 | sw. | 26 | w. | 27 | 17 | 3 | 11 | 12 | 4.4 | 4.2 | 21 | 57.2 | 1889 | 48.9 | 1880 |
| Point Reyes Light | ..... | ..... | ..... | ..... | 50.2 | ..... | 60 | 50.2 | 40 | 45.6 | 18 | 4 | ..... | .... | 2.38 | ..... | ..... | nw. | .... | ..... | ... | 15 | 8 | 8 | 10 | ... | ... | 3 | 54.1 | 1889 | 49.2 | 1890 |
| *S. Pac. Coast Region.* | | | | | 57.6 | + 0.2 | | | | | | | | | 0.50 | — 1.39 | | | | | | | | | | | | | | | | |
| Fresno | 338 | 29.67 | 30.03 | 0.38 | 54.4 | ..... | 78 | 64.9 | 32 | 44.0 | 31 | 8 | 42.8 | 68.8 | 0.81 | — 0.51 | 4,604 | nw. | 25 | nw. | 18 | 13 | 13 | 5 | 5 | 2.4 | 3.6 | 4 | 58.4 | 1889 | 54.1 | 1888 |
| Los Angeles | 330 | 29.64 | 29.99 | 0.44 | 58.4 | + 0.6 | 82 | 68.3 | 40 | 48.5 | 30 | 7 | 45.0 | 70.2 | 0.41 | — 2.45 | 3,046 | w. | 24 | w. | 23 | 14 | 10 | 7 | 4 | 3.0 | 3.3 | 14 | 60.6 | 1885 | 51.1 | 1888 |
| San Diego | 93 | 29.90 | 30.00 | 0.36 | 56.9 | — 0.1 | 76 | 64.4 | 41 | 49.4 | 24 | 6 | 48.6 | 74.6 | 0.27 | — 1.20 | 3,972 | w. | 24 | w. | 23 | 13 | 9 | 9 | 5 | 5.0 | 4.6 | 20 | 59.6 | 1885 | 52.1 | 1888 |

NOTE.—The data at stations having no departures are not used in computing the district averages. Letters of the alphabet denote number of days missing from the record.
* Two or more directions, dates, or years. † Precipitation is measured at the Boston Water Works. ‡ Received too late to be considered in departures, etc. § Total wind movement for 31 days.

Form Map G--1891.

# Chart I. Tracks of Areas

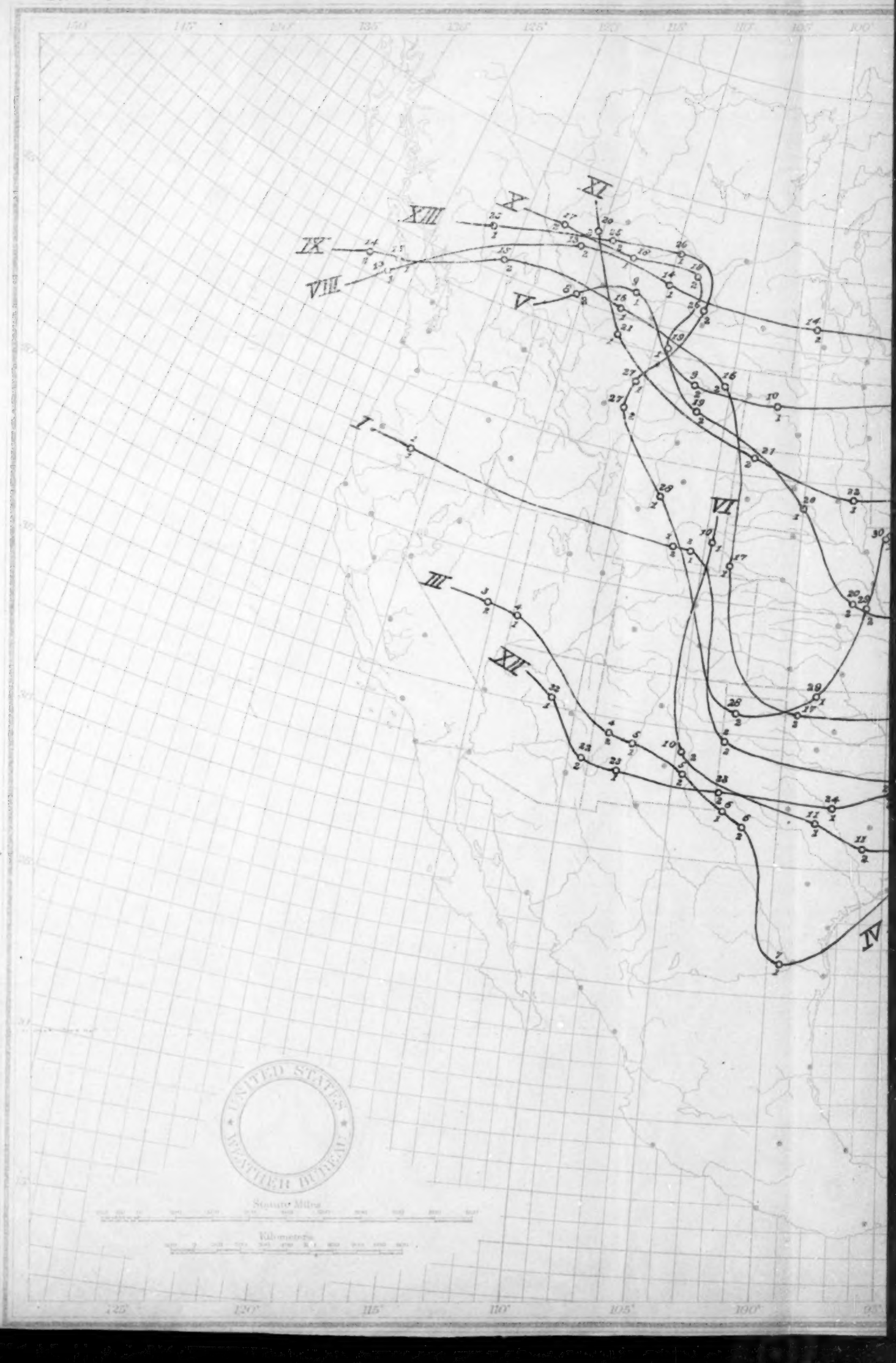
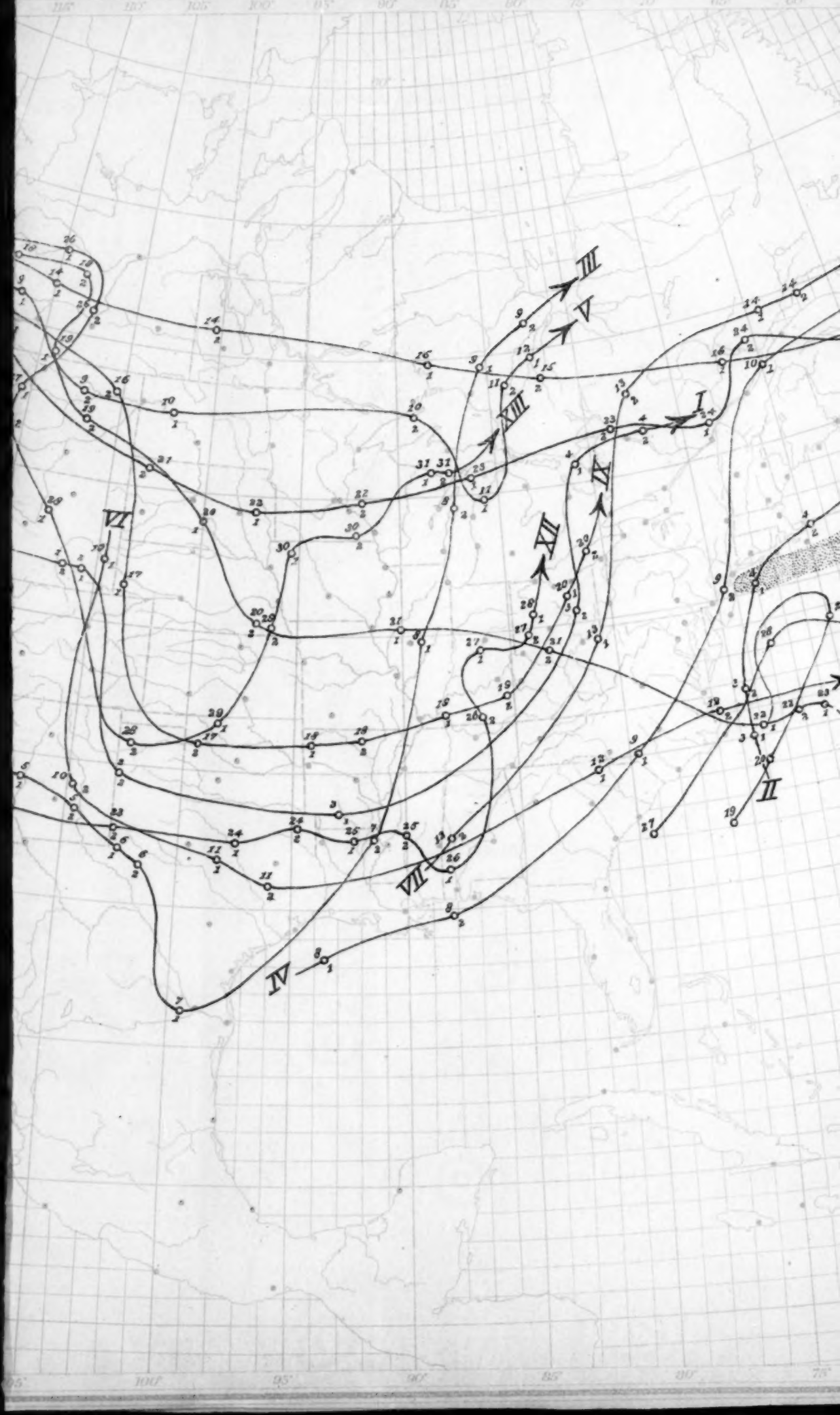
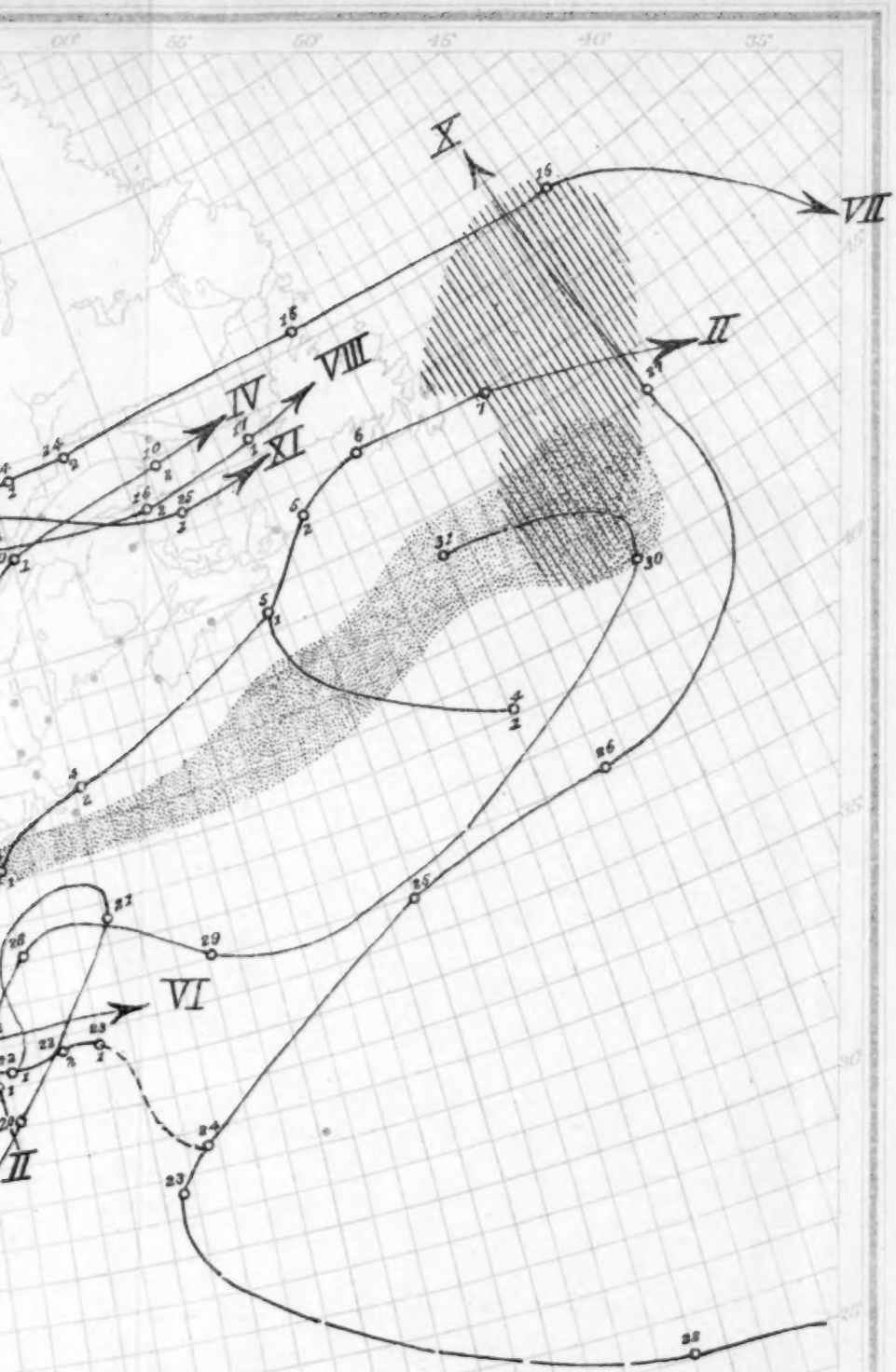


Chart I. Tracks of Areas of Low Pressure. March, 1891.






## NOTES.

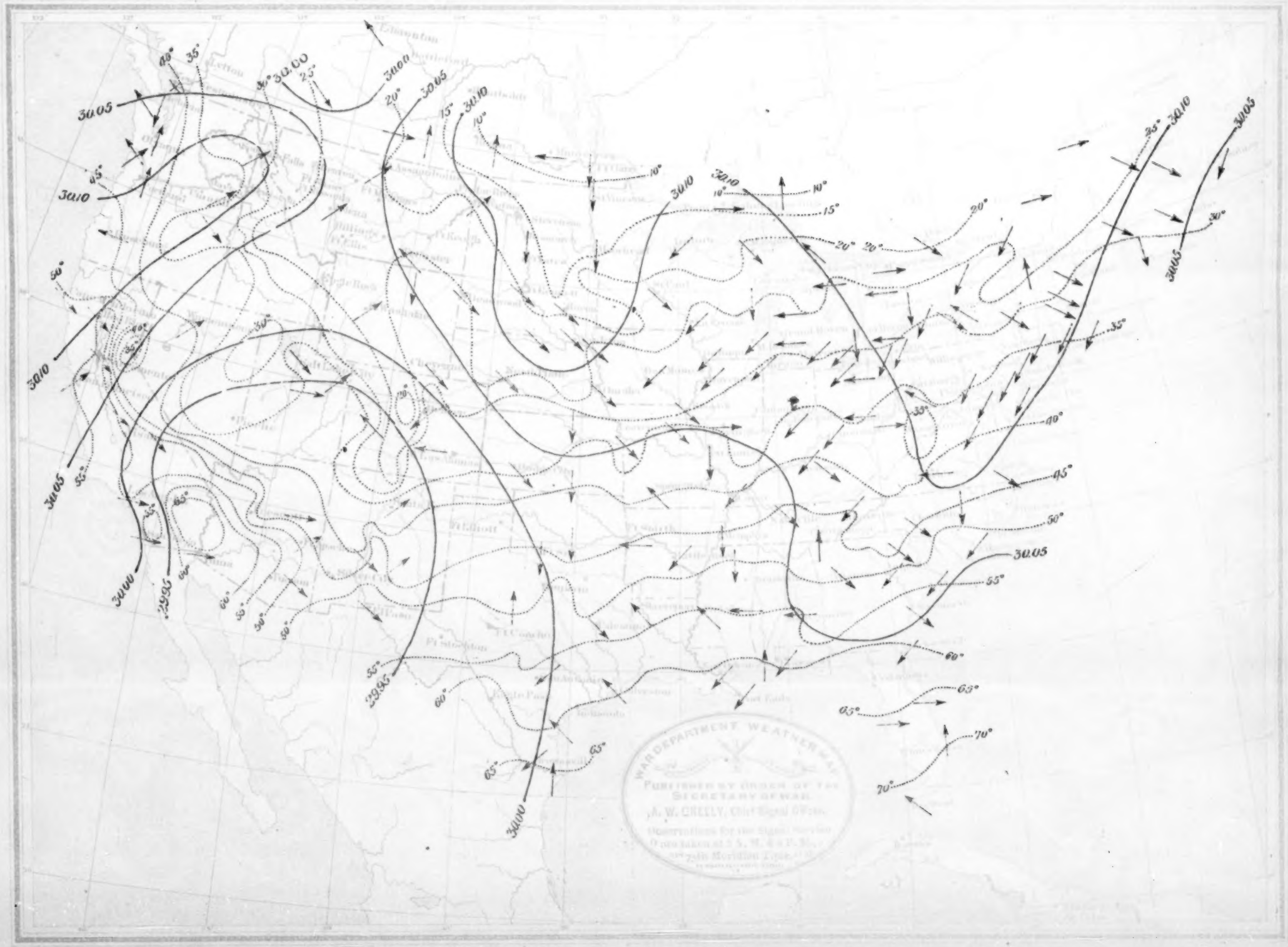
The Roman letters show number and order of areas of low pressure. The figures above the lines show the days of the month, those below (1 and 2) indicate, respectively, the 8 a. m. and 8 p. m., 75th meridian time, observations.

The dotted shading (▒▒▒▒) indicates fog belts.

The ruled shading (═══) indicates the position in which field-ice or icebergs were observed.

Form 106 F.

# Chart II. Isobars, Isotherms, and Winds. March, 1891.

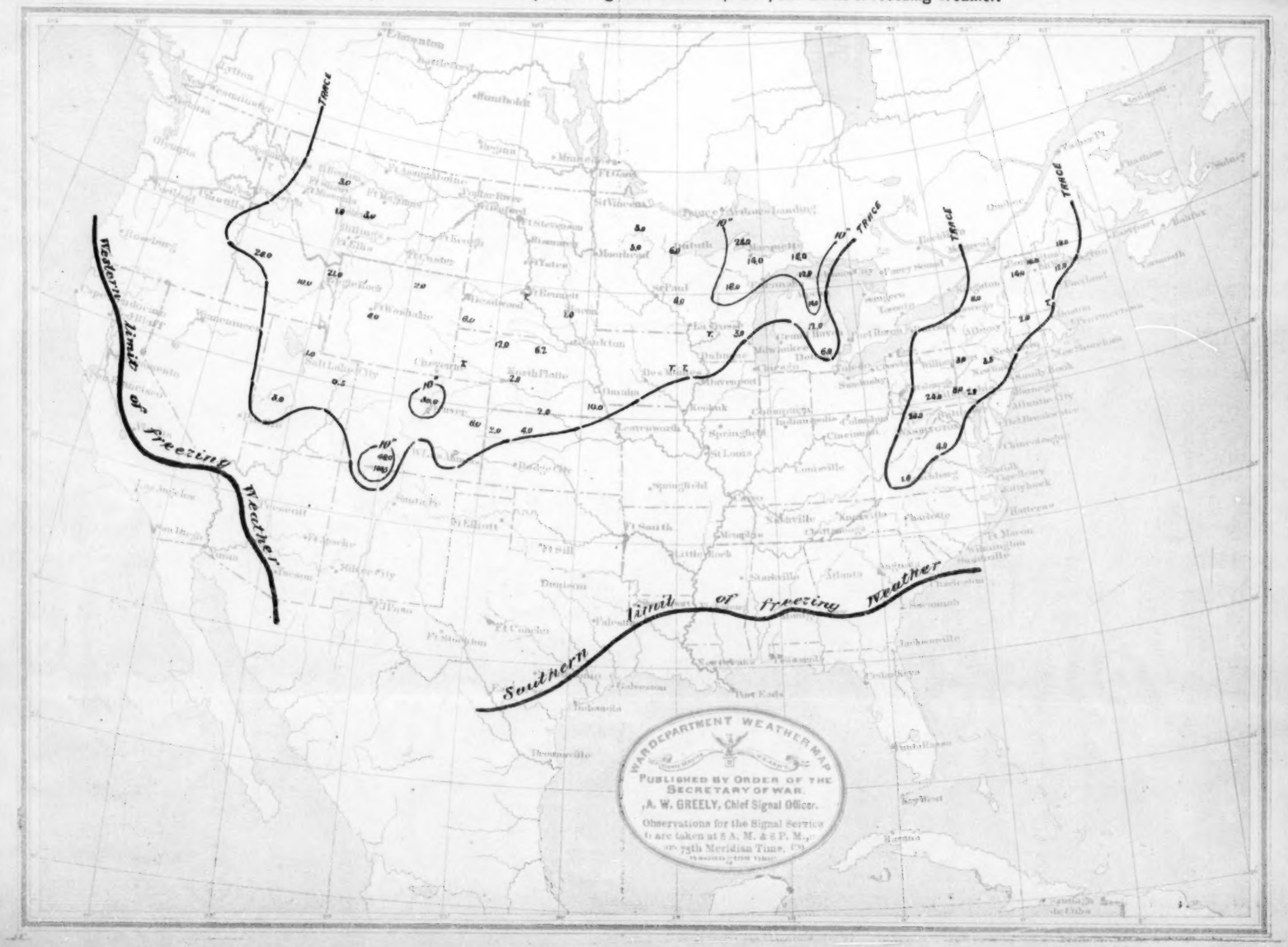


# Chart III. Precipitation. March. 1891.

Scale of Shades.
0 to 2 inches.
2 " 4 "
4 " 6 "
6 " 8 "
Over 8 "
WAR DEPARTMENT WEATHER MAP
PUBLISHED BY ORDER OF THE SECRETARY OF WAR
A. W. GREELY, Chief Signal Officer.
Observations for the Signal Service are taken at 8 A. M. 75th Meridian Time.

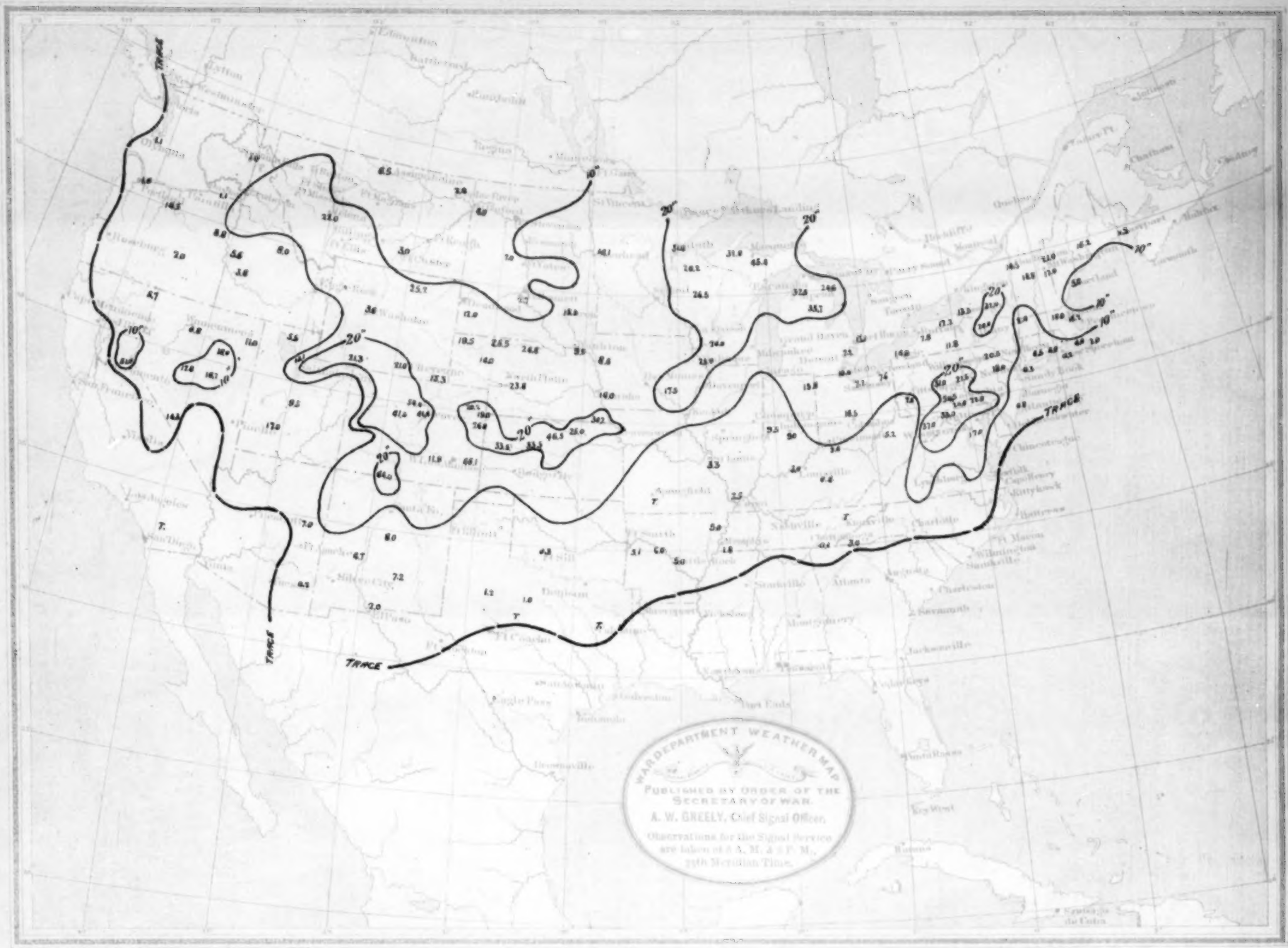
Form 336 F.

## Chart IV. Depth of Snow (inches) reported on ground March 31, 1891, and Limits of Freezing Weather.


Western limit of freezing weather
Southern limit of freezing weather
TRACE
WAR DEPARTMENT WEATHER MAP
PUBLISHED BY ORDER OF THE SECRETARY OF WAR.
A. W. GREELY, Chief Signal Officer.
Observations for the Signal Service are taken at 8 A. M. & 8 P. M., 75th Meridian Time.

Form 1065 E

# Chart V. Depth of Snowfall (inches). March, 1891.


TRACE
10"
20"
T.
WAR DEPARTMENT WEATHER MAP
PUBLISHED BY ORDER OF THE SECRETARY OF WAR.
A. W. GREELY, Chief Signal Officer.
Observations for the Signal Service are taken at 8 A. M. & 8 P. M., 75th Meridian Time.

*List of voluntary observers of the Signal Service, who furnish meteorological reports for the Monthly Weather Review.*

**Alabama.**

Prof P H Mell
Auburn Ala
Wm Fowler
Bermuda Ala
Wm H Swann
Bessemer Ala
W J Holland
Brewton Ala
Dr J G Michael
Citronelle Ala
W D Lovett
Columbiana Ala
A M Weiler
Double Springs Ala
Prof C W Ashcroft
Florence Ala
M H Yerby
Greensborough Ala
H Lamar
Jasper Ala
Prof J W A Wright
Livingston Ala
A J Weaver
Mountain Home Ala
Wm Garrett
Mount Willing Ala
Post Surgeon
(Mt Vernon Barracks)
Mount Vernon Ala
L B Thornton
Tuscumbia Ala
W H Newman
Uniontown Ala
Dr E P Nicholson
Valley Head Ala
Morgan D Jones
Wiggins Ala

**Alaska.**

Rev Eugene S Willard
Juneau Alaska
Jos Zuboff
Killisnoo Alaska
H S Tibbey
Coal Harbor
Unga Island Alaska

**Arizona.**

Mrs J H Hamilton
(Antelope Valley Ariz)
via Stanton
Geo Banghart (Bangharts)
Chino Ariz
Rev J G Pritchard
Bisbee Ariz
U G McWilliams
Buckeye Ariz
D D Ross (Chiracahua Mt)
Tombstone Ariz
E K Sykes
Calabasas Ariz
C E Cooley
Cooley's Spring
Fort Apache Ariz
Thomas Carroll
Cottonwood Ariz
Ed Vanderlip
Crittenden Ariz
T C Bain
Dos Cabezos Ariz
Ellis McFall
Dragoon Ariz
George F Cook
Dudleyville Ariz
Dr R B Tripp (Eagle Pass)
Fort Thomas Ariz
Richard H Farley
(Farley's Camp)
Tip Top Ariz
Post Surgeon
Fort Apache Ariz
Post Surgeon
Fort Bowie Ariz
Post Surgeon
Fort Grant Ariz
Post Surgeon
Fort Huachuca Ariz
M M Crocker
Fort Mojave Ariz
A T Colton
Florence Ariz
D Murphy
Gila Bend Ariz
E W Perkins
(Grand Central Mill)
Fairbank Ariz
D Rope
Holbrook Ariz
C R Hakes
Maricopa Ariz
Henry P Ewing
Mineral Park
(Chloride) Ariz
J W Stump (Mt Huachuca)
Tombstone Ariz
George W Wells
(Oro) Clifton Ariz
G W Bonacker
Payson Ariz
Cortez Cox
(Ariz Canal Co's dam)
Phœnix Ariz
Post Surgeon
Whipple Barracks
Prescott Ariz
Newton Barnes
Red Rock Ariz
D D Gowan
care F H Nash
Strawberry Ariz
G M Adams
Show Low Ariz
H Koshland
Signal Ariz
Post Surgeon
San Carlos Ariz
W F Simmons
Simmons Ariz
David K Udall
Springerville Ariz
L P Nash
Strawberry Ariz
C W Miller
Tempe Ariz
Miss Mary Tevis
Teviston Ariz
H V Wager
Tip Top Ariz
J S Robbins (Ash Canyon)
Tombstone Ariz
E L Wetmore
Tucson Ariz
T B Carter
Walnut Grove Ariz
F W Heyne (Walnut Ranch)
Powers Ariz
C P Smith
Wilgus Ariz
T D Bridger
(Wood Canon)
San Simon Ariz
G B Gardiner
Woodruff Ariz

**Arkansas.**

A J Hahn
Brinkley Ariz
R B Smith
Camden Ark
A P Robinson
Conway Ark
D H Hopkins
Dallas Ark
W A Verser
Devalls Bluff Ark
G L Teller
Fayetteville Ark
J H Bard
Forrest City Ark
Post Surgeon U S A
Hot Springs Ark
Prof R L Cowan
Harrisburgh Ark
A J Gaschen
Helena Ark
W H Pyburn
Lonoke Ark
M F Locke
Com of Agriculture
Little Rock Ark
Sgt F H Clark
Little Rock Ark
J E Coffer
Malvern Ark
Joseph Evins
Mount Nebo Ark
R C McMann
Newport Ark
Alex Goodrich
Osceola Ark
Geo Bradley
Ozone Ark
Ben M Hagey
Paragould Ark
Mrs H P Holt
Pine Bluff Ark
Peter Hamilton
Rogers Ark
J H McPherson
Russellville Ark
Dr E L Buerkle
Stuttgart Ark
M J Nash
Texarkana Ark
A Dunlap
Winslow Ark

**California.**

H L Fry
Arcata Cal
Post Surgeon
Alcatraz Island Cal
Dr A Fouch
Anderson Cal
Post Surgeon
(Angel Island)
San Francisco Cal
Post Surgeon
(Benicia Barracks)
Benicia Cal
C C Ball
Barstow Cal
Prof F Soule
Berkeley Cal
S E Gaskill
Campo Cal
Wm Barry (Centreville)
Niles Cal
Seward Cole
Colegrove Cal
D S Sartwell
Crescent City Cal
S Holland
Evergreen Cal
Post Surgeon
Fort Bidwell Cal
Post Surgeon
Fort Gaston
Hoopa Valley Cal
Post Surgeon
Fort Mason
San Francisco Cal
C M Fitzgerald
Georgetown Cal
B F Berriman
Grass Valley Cal
E T Foss
Hydesville Cal
C F Macey
(Iowa Hill)
Iowa City Cal
T T Tidball
Jolon Cal
W A Sickler
Julian Cal
F H McCullagh
Los Gatos Cal
Prof A J Burnham
Lick Observatory
San Jose Cal
Ed Wesson
Milton Cal
Director Chabot Obs'y
Oakland Cal
G W Smith
Palermo Cal
R Rowland
Placerville Cal
W E Keith
Riverside Cal
S H Gerrish 1517 G street
Sacramento Cal
Dr E K Abbott
Salinas Cal
Post Surgeon
Presido of San Fran
San Francisco Cal
Hugh D Vail
Santa Barbara Cal
Post Surgeon
San Diego Barracks
San Diego Cal
H Block
Santa Clara Cal
W R Springer
Santa Cruz Cal
L E Blochman
Santa Maria Cal
Robert Hall
Sonoma Cal
A T Mason (Steeles)
Edna Cal
T B Sanders
Susanville Cal
J E Boal
(Sweetwater Dam)
National City Cal
Samuel McCurdy
Truckee Cal
C F Sonne
Truckee Cal
W H Roscoe
Upper Mattole Cal
Wm N Lee
Valleton Cal
G O Coburn
Vacaville Cal
A Widmann
Volta Cal
J Titcomb
(Walla Walla Creek)
Fort Jones Cal
A L Bancroft
Walnut Creek Cal
Wm Lumbard
Wheatland Cal
A W Sehorn
Willow Cal
R H Piatt
(Mullans)
Woodland Cal

**Colorado.**

S T Shipman
Abbott Colo
S Cordeal
Akron Colo
James Harden
Alford Colo
C A Montross
Alma Colo
Mrs I Rogers
Apishapa Colo
Agent U P R R
Agate Colo
R G Taylor
Amherst Colo
C Duncan
Antonito Colo
T F Burke
Arboles Colo
Agent U P R R
Aroya Colo
J H Weller
Brandon Colo
L A Rawlings
Box Elder Colo
Dr B A Arbogast
Breckenridge Colo
Agent U P R R
Byers Colo
W F Bates
Beaver Creek Colo
Rev G C Huntington
Brush Colo
D S Harris
Burlington Colo
G E Lake
Boulder Colo
J M Boice
Crook Colo
W Holcomb
Castle Rock Colo
W B Felton
Canon City Colo
Jasper Walker
Chromo Colo
G C Wortman
Climax Colo
A Reichenecker
Como Colo
Agent U P R R
First View via
Cheyenne Wells Colo
G W Close
Cumbres Colo
Miss M Zaninetti
Delta Colo
Sgt W S Miller
Denver Colo
Agent U P R R
Deer Trail Colo
S S Pratt
Dillon Colo
A W Wing
(Eagle Farm)
Pueblo Colo
Prof L G Carpenter
Fort Collins Colo
Post Surgeon
Fort Lewis Colo
Post Surgeon
Fort Logan Colo
P P Wheaton
Georgetown Colo
John Pritchard
Greenhorn Colo
E P Moon
Husted Colo
Agent U P R R
Hugo Colo
T H Stevens
Idaho Springs Colo
L E Loveland
Julesburg Colo
Mrs N R Walters
Kirk Colo
Agent U P R R
Kit Carson Colo
G T Herbert
Lamar Colo
F S Cary
Laird Colo
A G Wallihan
Lay Colo
Chas Green
Le Roy Colo
John Pearce
Livermore Colo
Dr E J Clark
Longmont Colo
W E Culver
Las Animas Colo
M M Sprague
Moraine Colo
Agent U P R R
Magnolia Colo
C J Aldrich
Monte Vista Colo
A Cushman
Montrose Colo
J M Wadsworth
Pagoda Colo

J C Strawn
Pagosa Springs Colo
L S Kelly
Parachute Colo
H W Goodrich
Red Cliff Colo
G D Yokum
Rico Colo
Agent U P R R
River Bend Colo
F Watrous
Rocky Ford Colo
C T Woods
Saint Cloud Colo
G C Smith
Sanborn Colo
H H Griffin
(San Luis Ex Sta)
Monte Vista Colo
E C van Diest
San Luis Colo
J D Lucas
Sedgwick Colo
O A Rusk
Sheridan Lake Colo
F M Friend
Springfield Colo
Geo Polhill
Stamford Colo
C W Raymond
Stunner Colo
P Blumer
(Thon) Elizabeth Colo
L T Durbin
Villa Grove Colo
J T Kirkman
Vilas Colo
J H Kidney
Watervale Colo
J R Pickett (T S Ranch)
Whitewater Colo
Agent U P R R
Watkins Colo
T Charlton
Westcliffe Colo
J W Dilts
Wray Colo
Ira Edwards
Yuma Colo

**Connecticut.**

H R Stevens (Birmingham)
Stevenson Conn
G J Case
Canton Conn
S P Willard
Colchester Conn
M H Dean
Falls Village Conn
Post Surgeon
Fort Trumbull
New London Conn
Rev S Hart
Hartford Conn
W R Matson 47 Garden st
Hartford Conn
J H Tucker
Lebanon Conn
E A Bailey
Mansfield Conn
H D A Ward
Middletown Conn
R R Smith
New Hartford Conn
Rev Wm Goodwin
New Hartford Conn
C H Truesdale
North Grosvenor Dale Conn
Willis Earle
Norwalk Conn
R E Wyant
(Shelton) Birmingham Conn
K B Loomis
South Manchester Conn
L Andrews
Southington Conn
Miss E D Larned
Thompson Conn
W H Rathbone
Uncasville Conn
Rev E Dewhurst
Voluntown Conn
Mrs B F Harrison
Wallingford Conn
N J Welton
Waterbury Conn
S T Stockwell
West Simsbury Conn
L H Healey
North Woodstock Conn

**District of Columbia**

Post Surgeon
Washington Barracks
Washington D C
C L Washburn
Deaf and Dumb Asylum
Kendall Green
Washington D C

**Delaware.**

John S Jester
Dover Del
Wm Carnagy
Kirkwood Del

**Florida.**

C E Robins
Alva Fla
A F Wyman
Archer Fla
Bennett P Ferrell
Duke Fla
H W O Margary
Eustis Fla
Post Surgeon
(Fort Barrancas)
Warrington Fla
A H Adams
Fort Meade Fla
J S Wade
Homeland Fla
H D Pierce
Hypoluxo Fla
Dr James C Neal
Lake City Fla
Rev J H White
(Merritts Id) Georgiana Fla
David S Woodrow
Ocala Fla
Dr Geo E Walton
Orange City Fla
Post Surgeon
(St Francis Barracks)
St Augustine Fla
Paul R Gailmard
San Antonio Fla
Rev W H Carter
Tallahassee Fla
C D Webster
Tarpon Springs Fla

**Georgia.**

W P Briggs
Athens Ga
Prof L H Charbonnier
Athens Ga
Post Surgeon
Fort McPherson
Atlanta Ga
Prof D M Wade
Blakely Ga
H P Wallace
Butler Ga
Wm Kimzey
(Diamond) Roy Ga
H A Roebuck
Elberton Ga
T G Scott
Forsyth Ga
R L Rhodes
Hephzibah Ga
C W Meaders
Gillsville Ga
J E Howland
Lithia Springs Ga
G W Warren
Louisville Ga
G S Owen
Marietta Ga
S A Cook
Milledgeville Ga
G F Meriwether
Monticello Ga
C M Witcher
Point Peter Ga
J F Wilson
Poulan Ga
J L Cutler
Quitman Ga

**Idaho.**

Frank Campbell
American Falls Idaho
A C Bomar
Bonanza City Idaho
Post Surgeon
Boise Barracks
Boise City Idaho
J W Cowden
Era Idaho
Post Surgeon
Fort Sherman
Sherman Idaho
J C Soward
Garden Valley Idado
D McLoughlin
Kootenai Idaho
R Schleicher
Lewiston Idaho
G M Wilson
Mullan Idaho
Dr F B Delano
Payette Idaho
A H Soward
Placerville Idaho
Ferdinand Alers
Ruthberg Idaho

**Illinois.**

J W C Gray
Atwood Ill
Dr M M Robbins
Aurora Ill
W Holden
Aurora Ill
L H Sullivan
Beason Ill
E L Lawrence
Belvidere Ill
J L Hallam
Centralia Ill
J B Dazey
Charleston Ill
J L Jæger
Cockrell Ill
Dr J L R Wadsworth
Collinsville Ill
C L Farrington
East Peoria Ill
L A Michels
Flora Ill
Post Surgeon
Fort Sheridan
Highwood Ill
J E Y Hanna
Golconda Ill
Prof M S Oudyn
Greenville Ill
Shirley E Gray
Griggsville Ill
A T Purviance
Hennepin Ill
Wm Rogan
(Irishtown) Carlyle Ill
W J S Cathcart
(Jordan's Grove)
Marissa Ill
Rev A C Price
Lacon Ill
B A Jenkins
Louisville Ill
C H Beeler
Lanark Ill
J B Sheapley
Martinsville Ill
Dr G Leibrock
Mascoutah Ill
J Withington
Mattoon Ill
W P Gibbs
McLeansborough Ill
C H Fahs
Olney Ill
V E Phillips
Olney Ill
J S Seeley
Oswego Ill
Dr J O Harris
Ottawa Ill
J E Templeton
Palestine Ill
J K Eberle
Pana Ill
Dr F Brendel
Peoria Ill
H A Burr
Philo Ill
Isaac Young
Pontiac Ill
T D Robertson
Rockford Ill
Post Surgeon
Rock Island Arsenal
Rock Island Ill
J W James (Riley)
Marengo Ill
N T Veatch
Rushville Ill
S C Lincoln
Sandwich Ill
Dr M D Ewell (S Evanston)
Room 52 97 Clark St
Chicago Ill
Sgt John Craig
Springfield Ill
R Dow
Sycamore Ill
Warren High School
Warren Ill
P J Bates
White Hall Ill
F Osborne
Winnebago Ill

**Indiana.**

L Stealy
Angola Ind
C F Hole
Butlerville Ind
Dr N I Kithcart
Columbia City Ind
J A Perry
Columbus Ind
R Hessler
Connersville Ind
T E Huston
Cannelton Ind
J T De Munbrun
Crandall Ind
J P White
De Gonia Springs Ind
Higginbotham & Son
Delphi Ind
D A Owens
Franklin Ind
W J Davidson
Farmland Ind
C R Kluger
Huntingburgh Ind
Sgt C F R Wappenhans
Indianapolis Ind
J C Loomis
Jeffersonville Ind
Prof H A Huston
La Fayette Ind
D E Prior
Logansport Ind
J M Johnson
Marengo Ind
Prof J L Massena
Marion Ind
E Kirkwood
Mauzy Ind
J C Black
Michigan City Ind
J M Lockwood
Mount Vernon Ind
Stephen & Durham
Muncie Ind
E Jones
Princeton Ind
J F Hood
Point Isabel Ind
E J Mote
Richmond Ind
Dr W N Wirt
Rockville Ind
J A Forsythe
Seymour Ind
S B Morris
Shelbyville Ind
Prof J N Roe
Valparaiso Ind
Prof C G Boerner
Vevay Ind
Dr W B Squire
Worthington Ind

**Indian Territory.**

Post Surgeon
Fort Supply Ind T
G H Heald
Healdton Ind T
Wm Noble
South McAlester Ind T

**Iowa.**

David E Hadden
Alta Iowa
H H Peterson
Alta Iowa
J W Love
Atlantic Iowa
Conrad Schadt
Amana Iowa
J Rush Lincoln
Ames Iowa
H N Renfrew
Bancroft Iowa
W F Evans
Bedford Iowa
H W Van Dike
Belle Plaine Iowa
James Rodgers
Blakeville Iowa
Moses Simon
Carroll Iowa
G N Ferguson
Carson Iowa
A C Page
Cedar Falls Iowa
H D Olds
Cedar Rapids Iowa
Dr J W Smith
Charles City Iowa
A S Van Sandt
Clarinda Iowa
Luke Roberts
Clinton Iowa
Gregory Marshall
Cresco Iowa
J M Ellem
Concord Iowa
Wm R Fox
Dallas Centre Iowa
P H Schlumberger
Denison Iowa
Sgt George M Chappell
Des Moines Iowa
Adolphus Vogeli
Des Moines Iowa
C A Schaffter
Eagle Grove Iowa
J Fred Clark
Fairfield Iowa
R Z Latimer
Fayette Iowa
Miss L A McCready
Fort Madison Iowa
Seth Dean
Glenwood Iowa

J G Culver
Greenfield Iowa
Prof S J Buck
Grinnell Iowa
E C Grenelle
Hampton Iowa
M T Ashley
Hopeville Iowa
Miss Florence Prouty
Humboldt Iowa
Emil F Wulfke
Independence Iowa
Prof J L Tilton
Indianola Iowa
Prof A A Veblen
Iowa City Iowa
Mrs M B Stern
Logan Iowa
H B Strever
Larrabee Iowa
W L Thompson
Manson Iowa
Dr A B Bowen
Maquoketa Iowa
Chas R Brown
Marshalltown Iowa
George Price
(Maxon) Albia Iowa
H D Smith
Monticello Iowa
Dr Max E Witte
Mt Pleasant Iowa
Prof Alonzo Collins
Mt Vernon Iowa
Miss Ruby P Barr
McCausland Iowa
J P Walton
Muscatine Iowa
A W Lewis
Murray Iowa
G D Pattingill
Osage Iowa
Jos Boyd
Oskaloosa Iowa
Wm J Wicks
Panama Iowa
Dr Caleb Brown
Sac City Iowa
A J Bond
Storm Lake Iowa
J M Rider
Tipton Iowa
T F McCune
Vinton Iowa
W A Cook
Washington Iowa
Wm Ward
Stilson Iowa
C M Trumbauer
Webster City Iowa
P Dorweiler
West Bend Iowa
Merton L Fuller
Williams Iowa

## Kansas.

W P Gulick
Abilene Kans
J J Cass
Allison Kans
A H Goddard
Alton Kans
J W Gander
Altoona Kans
H E Faidley
Burr Oak Kans
Agent U P R R
Buffalo Park Kans
C S Culver
Bucklin Kans
J M Lobaugh
Coldwater Kans
J W Young
Columbus Kans
H A Williams
Concordia Kans
A G Alrich
Cawker City Kans
E Shaw
Cunningham Kans
Agent U P R R
Collyer Kans
J W Young
Columbus Kans
J B Handy
Downs Kans
C W Gilman
Elco Kans
Dr A C Williams
Elk Falls Kans
Prof T H Dinsmore Jr
Emporia Kans
C D Perry
Englewood Kans
Ben C Rich
Eureka Ranch
Ellis Kans
Agent U P R R
Ellis Kans
Ed Atkin
Fremont Kans
Post Surgeon
Fort Leavenworth Kans
Post Surgeon
Fort Riley Kans
Post Surgeon
Military Prison
Fort Leavenworth Kans
Jesse Royer
Gove Kans
Agent U P R R
Grinnell Kans
Agent U P R R
Grainfield Kans
R M Lawyer
Grenola Kans
Wm Featherstone
Globe Kans
L W Dennen
Havensville Kans
D C Ruth
Halstead Kans
W S Belden
Horton Kans
C Bishir
Hutchison Kans
J M Altaffer
Independence Kans
Dr E R Heath
1115 Garfield Ave
Kansas City Kans
P L Bliss
Kingman Kans
Jacob Nixon
Kellogg Kans
Dr W M Goodwin
La Crosse Kans
Isaac S Coe
La Harpe Kans
Prof F H Snow
Lawrence Kans
F R French
Lakin Kans
C B Jennings
Lebo Kans
J F Chambers
Leoti Kans
Wm Graves
Lincoln Kans
C P Blachley
Manhattan Kans
C M Breese Agric'l Col
Manhattan Kans
R P Edgington
Morse Kans
J L Steel
Minneapolis Kans
A C Abbott
Marmaton Kans
J H Starke
Macksville Kans
Agent U P R R
Monument Kans
Agent U P R R
McAllaster Kans
Ed F Haberlein
McPherson Kans
Dr E M Turner
Norton Kans
Agent U P R R
Ogallah Kans
Agent U P R R
Oakley Kans
D Doyle
Oswego Kans
Miss Maud Adams
Page Kans
W T Jackson
(Pauline) P O Box 247
Topeka Kans
Agent U P R R
Plainville Kans
N A Andrews
Pleasant Dale Kans
Agent U P R R
Quinter Kans
Miss Florence Leidigh
Spearville Kans
F T Dunklee
Springvale Kans
H D McQuade
Stafford Kans
D M Adams
Rome Kans
A P Collins
Salina Kans
J W Goodell
Sedan Kans
Dr S S Kaysbier
Seneca Kans
S P Kane
Scott City Kans
W H Harvey
Shields Kans
Agent U P R R
Sharon Springs Kans
C E Wightman
Tribune Kans
Prof J T Lovewell
Topeka Kans
Sgt T B Jennings
Topeka Kans
J W Tipton
Toronto Kans
W P Cochran
Wakefield Kans
Agent U P R R
Wa Keeney Kans
J H Wolfe
Wellington Kans
Agent U P R R
Weskan Kans
P S Cross
Wilson Kans
Agent U P R R
Winona Kans
Agent U P R R
Wallace Kans

## Kentucky.

M H Crump
Bowling Green Ky
H B Bonar
Caddo Ky
C H Major
Canton Ky
Dr Melvin Rhorer
Central City Ky
J B Atkinson
Earlington Ky
Miss Lee Ray
Edmonton Ky
Commanding Officer
Fort Thomas Newport Ky
E C Went
Frankfort Ky
T W MacGill
Franklin Ky
Dr F L Harrod
Harrodsburgh Ky
V E Muncey
Lexington Ky
Sgt Frank Burke
Louisville Ky
A H Martine
Middlesborough Ky
H C McKee
Mount Sterling Ky
Post Surgeon
Newport Barracks
Newport Ky
Oscar Haynes
Pellville Ky
Wm Martindell
Princeton Ky
Prof O H Kennedy
Richmond Ky
H W Prissler
Shelbyville Ky

## Louisiana.

Dr C J Edwards
Abbeville La
Miss Grace Manard
Amite City La
Prof H A Morgan
Baton Rouge La
Dr L D Chauff
Bonnet Carre La
W W Wall
Cheneyville La
J A White Jr
Clinton La
L M Howard
Coushatta La
A B Goodrich
Crowley La
Hon S P Henry
Cameron La
Dr W V Taylor
Davis La
W P Moore
Delhi La
L D Martin
Edgard La
Moses Haas
Farmerville La
Prof G Williamson
Grand Cane La
J R Brown
Girard La
Rev J P Moore S J
Grand Coteau La
A F Chanfrau
Houma La
D N Harris
Homer La
G W Whitworth
Jeanerette La
Prof W C Stubbs
Sugar Ex Station
Kenner La
J J Davidson
La Fayette La
Gov H C Warmoth
Lawrence La
Dr Wm Meyer
Lake Charles La
A Werner
Lawrence La
Dr E A Crawford
Liberty Hill La
M R Bein
Luling La
L J Dodge
Melville La
W S Hunter
Minden La
Alex Band
Mandeville La
W W Renwick
Monroe La
L Molenar
Marksville La
R Benefield
Maurepas La
James S Cosgrove
Natchitoches La
Mrs J A Gebert
New Iberia La
Sgt G E Hunt
New Orleans La
Post Surgeon
Jackson Barracks
New Orleans La
J E Le Blane
Paincourtville La
P G Kleinpeter
Plaquemine La
E Dechamps Jr
Shell Beach La
Maj S T Grisamore
Thibodeaux La
T A Williams
West End La
Dr W M Guice
Winnsborough La

## Maine.

Post Surgeon
Kennebec Arsenal
Augusta Me
Jos Wood
Bar Harbor Me
L H Murch
Belfast Me
Dr D E Seymour
Calais Me
Silas West
Cornish Me
H M Mansfield
Fairfield Me
J M S Hunter
Farmington Me
Prof W C Strong
Kent's Hill Me
Union Water Power Co
Lewiston Me
V P Hall
Mayfield Me
G L Upton
Millridge Me
Prof M C Fernald
Orono Me
Post Surgeon
Fort Preble Portland Me
C Hopkins
West Jonesport Me

## Maryland.

Post Surgeon
Fort McHenry
Baltimore Md
A E Acworth
Barren Creek Springs Md
E T Shriver
Cumberland Md
H Shriver
Cumberland Md
Prof G G Curtis
Fallston Md
McClintock Young
Frederick Md
J T De Sellum
Gaithersburgh Md
Jos Plummer
Jewell Md
McDonogh Institute
McDonogh Md
Mt St Mary College
Mt St Mary's Md
Dr C W Weaver
Taneytown Md
Woodstock College
Woodstock Md

## Massachusetts.

A B Wiggins
Andover Mass
Miss S C Snell
Amherst Mass
Hatch Experiment Station
Amherst Mass
Ag'l Experiment Station
Amherst Mass
Post Surgeon
Fort Warren Boston Mass
Prof W H Niles
Boston Mass

Rev A K Teele (Blue Hill)
Milton Mass
Prof A L Rotch (Blue Hill)
Readville Mass
Desmond Fitz Gerald
Brookline Mass
Harvard College Observat'y
Cambridge Mass
E C Brooks (Cambridge)
Mt Auburn Mass
Prof W M Davis
Cambridge Mass
Pvt J Warren Smith
Cambridge Mass
F H Norton
Chicopee Mass
G W Weeks
Clinton Mass
F A Tower
Concord Mass
Gen J H Reid
Cotuit Mass
Jas Childs
Deerfield Mass
Conant Observatory
Dudley Mass
C V S Remington
Fall River Mass
O B Truesdell
Fiskdale Mass
Dr J Fisher
Fitchburg Mass
Nelson Dupuy
Florida Mass
Dr A P Mason
Fitchburg Mass
Boston Water Works
Framingham Mass
Dr W U Brown
Gilbertville Mass
C Woolley
Groton Mass
J S Francis
Groton Mass
B B Cutler
Heath Mass
Essex Company
Lawrence Mass
Leicester Academy
Leicester Mass
W B Hosmer
Leominster Mass
Prop Locks & Canals
Lowell Mass
F E Saunders
Lowell Mass
M W Graves
Ludlow Mass
J Haviland
Ludlow Mass
J C Haskell
Lynn Mass
W C Winter
Mansfield Mass
R M Gow
Medford Mass
Middleborough Water Wk's
Middleborough Mass
Dr G E Fuller
Monson Mass
Wm Street
(Mount Nonotuck)
Mount Tom Mass
Dr W D Hodges
Nahant Mass
T R Rodman
New Bedford Mass
New Bedford Water Works
New Bedford Mass
F V Pike
Newburyport Mass
Newburyport Water Works
Newburyport Mass
J M Clark
Northampton Mass
C H Kohlrausch Jr
North Billerica Mass
Miss L B Knapp
Plymouth Mass
J R Smith
Provincetown Mass
Miss L W Chase
Royalston Mass
Mrs I D Page
Randolph Mass
Elisha Slade
Somerset Mass
A A Smith
Salem Mass
H W Cushing
South Hingham Mass
Post Surgeon
National Armory
Springfield Mass
Dr E U Jones
Taunton Mass
A F Sprague
Taunton Mass
Taunton Water Works
Taunton Mass
C H Wilmarth
Taunton Mass
J S Newcomb
Westborough Mass
J B Hall
Worcester Mass
Worcester Academy
Worcester Mass
Dr S W Abbott
Wakefield Mass
Boston Mf'g Co
Waltham Mass
Prof Sarah F Whiting
Wellesley Mass
G S Newcomb
Westborough Mass
L R Symmes
Winchester Mass

**Michigan.**

G W Grigsby
Allegan Mich
P M Smith
Alma Mich
W H Howard
Adrian Mich
H Obenhoff
Atlantic Mine Mich
Prof C E Barr
Albion Mich
Wm Atkin (Arbela)
Millington Mich
J W Glover
Ann Arbor Mich
F N Hilton (Ball Mt)
Pontiac Mich
R O Gould (Berlin)
Smith Mich
Mrs Ida McDiarmid
Bear Lake Mich
David Straehly (Bronson)
Burr Oak Mich
C W Cornwall
Bell Branch Mich
C Leavitt
Bellaire Mich
W J Jones
Berrien Springs Mich
F A Zerby
Berrien Springs Mich
Dr H V Tutton
Benton Harbor Mich
D B Alger
Birch Run Mich
S Alexander
Birmingham Mich
H D Burrell
Bangor Mich
C F Howe
Buchanan Mich
D Woodward
Clinton Mich
E S Grierson
Calumet Mich
H J Webb
Cassopolis Mich
Jacob Walton
Cheboygan Mich
A A Hall
Chelsea Mich
A M Shotwell
Concord Mich
G W Teller
Colon Mich
W C Brown
Crystal Falls Mich
E H Green
Charlevoix Mich
Jas A Hunt
Crawford Mich
Dr N D Yale
Deerfield Mich
Post Surgeon
Fort Wayne Detroit Mich
J W Chapin
Eden Mich
Mrs H A Hepburn
Evart Mich
L D Watkins
Fairview Mich
M Conklin
Fitchburgh Mich
C I Rathbun
Fremont Mich
W L Fisher
Flint Mich
J W Morris
Grape Mich
F W Ball
Grand Rapids Mich
Dr O Palmer
Grayling Mich
J H Scott
Gaylord Mich
Prof F C Smith
Gladwin Mich
A Beebe
Gulliver Mich
F W Munson
Howell Mich
E B Rodgers
Hillsdale Mich
L B Smith
Hanover Mich
E S Shaw
Harbor Springs Mich
F H Edwards
Hart Mich
Dr W W Mitchell
Harrisville Mich
Dr F R Timmerman
Hastings Mich
F N Clark
Harrison Mich
A D DeGarmo
Highland Station Mich
C F Leipprandt
Hayes Mich
C W Cain
Hillman Mich
A H Boies
Hudson Mich
J B Thorburn
Holt Mich
R H Moross
Ionia Mich
O L Giddings
Ivan Mich
J A Rath
Jackson Mich
W Bice
Jeddo Mich
W A Black
Kalamazoo Mich
Dr H B Baker
Sec State Board of Health
Lansing Mich
Sgt N B Conger
Lansing Mich
A Lathrop
Lathrop Mich
G A Whitbeck
Montague Mich
H C Bradish (Madison)
Adrian Mich
N Cody
Mayville Mich
Post Surgeon
Fort Mackinac
Mackinac Id Mich
Jas White (Caldwell)
Manton Mich
Dr G H Green
Marshall Mich
J A Hartzler
Mottville Mich
E E Bushnell
Noble Mich
H Wilson
North Aurelius Mich
P Mayo
(North Marshall)
Battle Creek Mich
H E Gill
Northport Mich
Olivet College
Olivet Mich
W H Faxon
Ovid Mich
C H Prentiss
Otsego Mich
L Marvill
Parkville Mich
H M Warren
Pontiac Mich
J W Hutchins
Pulaski Mich
J C Gould
Paw Paw Mich
L R Brown
Rawsonville Mich
W A Brotherton
Rochester Mich
Dr W C Gates
Rockland Mich
John Mason
Roscommon Mich
Prof O D Thompson
Romeo Mich
O A Hunt
St John's Mich
W E Nims
Sand Beach Mich
Rev J Ferris
St Ignace Mich
J J Decker
Standish Mich
C H Force
Stockbridge Mich
C R Gardner
Stanton Mich
Post Surgeon Ft Brady
Sault de Ste Marie Mich
Dr J S Caulkins
Thornville Mich
M M McCormack
Vienna Mich
A Smith
Vandalia Mich
W A Weeks
West Branch Mich
W H Middagh
White Pigeon Mich
J H Forster
Williamston Mich
J J Gilding
Weldon Creek Mich
V W Eaton (Washington)
Romeo Mich
J C Bemiss
Ypsilanti Mich

**Minnesota.**

C E Crane
Alma City Minn
John Ross
Crookston Minn
D F Akin
Farmington Minn
Dr C F Dight
Faribault Minn
C F Greening
Grand Meadow Minn
John Ellingson
(Leach Lake)
Grand Rapids Minn
Miss Clarrie Tanner
Kinbrae Minn
Hans Olson
(Lake Winnibigoshish Dam)
Grand Rapids Minn
L B Davis
Le Sueur Minn
H P Cushing
Mankato Minn
Wm Cheney
Minneapolis Minn
D T Wheaton
Morris Minn
L G Moyer
Montevideo Minn
Carleton College
Northfield Minn
Neil Johnson (Pine River)
Brainerd Minn
B C Finnegan
(Pokegama Falls)
Grand Rapids Minn
Prof O Whitman
Red Wing Minn
Capt F Wherland (Rolling Green)
Fairmont Minn
H W Hill
St Charles Minn
Cpl John Healy
Minneapolis Minn
L Curry
Sheldon Minn
Post Surgeon
Fort Snelling Minn

**Mississippi.**

Prof J M White
Agricultural College Miss
John Osoinach
Bay St Louis Miss
E W Bee
Brookhaven Miss
J M Cox
Batesville Miss
A G Smith
Booneville Miss
G W Smith-Vaniz
Canton Miss
C W Barber
Edwards Miss
James E Mills
Enterprise Miss
I N Bedford
Fayette Miss
E R Somerville
Greenville Miss
J H Cleveland
Hattiesburgh Miss
Dr F B Shuford
Holly Springs Miss
L Heyman
Kosciusko Miss
Capt C D Koch (Logtown)
Pearlington Miss
B T Webster
Louisville Miss
P E Blumer
Moss Point Miss
W H Hill
Palo Alto Miss
Dr C W Bolton
Pontotoc Miss
Dan McCall
(Ship Island) Biloxi Miss
J N Teunisson
Summit Miss
Prof R B Fulton
University Miss
A J Sanderson
Vaiden Miss

A Erikson
Water Valley Miss
W S Davis
Waynesborough Miss
Prof J Reeves
Washington Miss
W S Coleman
West Point Miss
H C Goosey
Yazoo City Miss

**Missouri.**

Dr H W Tuttle
Adrian Mo
L T Theilmann
Appleton City Mo
Miss Nellie A Webster
Austin Mo
Newburn & Co
Bethany Mo
L Benecke
Brunswick Mo
R Q Roache
California Mo
W D Vandiver
Cape Girardeau Mo
Pettit & Welch
Carrollton Mo
G E Harris
Cassville Mo
Dwight C Hanna
Carthage Mo
Dr M McKenzie
Centreville Mo
Levi Chubbuck
Columbia Mo
Sgt A L McRae
Columbia Mo
Rev Fr Paul
Conception Mo
Henry Miller
Concordia Mo
Wick Morgan
Dadeville Mo
W H Broaddus
Darksville Mo
S Newton
Eldon Mo
A Reinisch
Excelsior Springs Mo
Prof T Berry Smith
Fayette Mo
Fred W Duenckel
Forest Park Sig Station
Saint Louis Mo
Sam M Ruley
Oregon Mo
Wm Muir
Fox Creek Mo
Prof C W Pritchett
Glasgow Mo
L M Bean
Gordonville Mo
C L Hixson
Hannibal Mo
A J Sharp
Harrisonville Mo
S W Maushund
Hermann Mo
S J Spurgeon
2416 E 9th st
Kansas City Mo
Mrs J E Emerson
Kidder Mo
S S Stahl
Kidder Mo
D W Hughes
Laddonia Mo
W D Wade
Lamonte Mo
Mrs Ida L Joslin
Langdon Mo
J S Slaven
La Monte Mo
M W Serl
Lebanon Mo
J R Eaton
Liberty Mo
E R Graham
(Marshall) Grand Pass Mo
W H Black
Marshall Mo
J D Sanders
Mine La Motte Mo
Max Eimbeck
New Haven Mo
Henry Bruihl
Oak Ridge Mo
Wm Kaucher
Oregon Mo
M B W Harman
Pickering Mo
W A McDowell
Platt River Mo
Silas C Turnbo
Protem Mo
Wm Hirons
Princeton Mo
C B Armstrong
Sarcoxie Mo
Dr J R Mudd
St Charles Mo
L C Saeger
St Charles Mo
Post Surgeon
Jefferson Barracks
Saint Louis Mo
Prof F E Nipher
Washington University
Saint Louis Mo
C G Taylor
Sedalia Mo
J S Chandler
Shelbina Mo
E A Pinnell
Steelville Mo
Prof Geo L Osborne
Warrensburg Mo
Prof J H Frick
Warrenton Mo
G W Goodlett
Windsor Mo
J R Dudley
Wither's Mill Mo

**Montana.**

R W Rock
(Henry's Lake Idaho)
Allerdice Mont
A E Woodward
Castle Mont
S M Corson
Choteau Mont
Post Surgeon
Fort Assinniboine Mont
Post Surgeon
Fort Custer Mont
Post Surgeon
Fort Keogh Mont
Post Surgeon
Fort Missoula Mont
Post Surgeon
(Camp Poplar River)
Poplar Creek Agency Mont
Post Surgeon
Fort Shaw Mont
J H Ray
Glendive Mont
R C Clendenin
Martinsdale Mont
Dr J E Jenkins
(Blackfeet Agency)
Piegan Mont
J M Graham
Powderville Mont
Eugene Stark
Virginia City Mont

**Nebraska.**

Dr W R Lewis
Alliance Nebr
G W Mitchell
Arborville Nebr
G Shedd
Ashland Nebr
Peter Fowlie
Ansley Nebr
A H Gale
Bassett Nebr
G Roberts
Creighton Nebr
Prof G D Swezey
Crete Nebr
C E Chadsey
Crete Nebr
Sgt G A Loveland
Crete Nebr
Chas Seltz
De Soto Nebr
E B Taylor
David City Nebr
Dr I Humphrey
Fairbury Nebr
P B Gailord
Fairfield Nebr
Post Surgeon
Fort Niobrara Nebr
Post Surgeon
Fort Omaha Nebr
Post Surgeon
Fort Robinson Nebr
Post Surgeon
Fort Sidney Nebr
J N Bennett
Franklin Nebr
Isaac E Heaton
Fremont Nebr
W L Rutledge
Grant Nebr
J B Moore
Grand Island Nebr
G S Truman
Genoa Nebr
John P Finley
Gering Nebr
Dr J T Fleming
Harvard Nebr
O F Hartwell
Hastings Nebr
Wm Waterman
Hay Springs Nebr
Dr C M Easton
Hebron Nebr
M E Randolph
Holdrege Nebr
G D Carrington
Auburn Nebr
J M Bird
Imperial Nebr
Mrs M G Erickson
Kennedy Nebr
D Henderson Jr
Kimball Nebr
University of Nebraska
Lincoln Nebr
J M Tipton
Lexington Nebr
R W Blake
Long Pine Nebr
John Ellis (Marquette)
Central City Nebr
J Hull
Minden Nebr
G W Wilkinson
Norfolk Nebr
E W Black
North Loup Nebr
J B Parmalee
Nebraska City Nebr
G S Clingman
Oakdale Nebr
A N Morris
O'Neill Nebr
F M Larison
Ough Nebr
C Shieldstream
Palmer Nebr
R P Harris
Paxton Nebr
E Smith
Ravenna Nebr
P W Risser
Syracuse Nebr
J S Spooner
Sargent Nebr
W J Hoyford
Seward Nebr
W L Dunlap
Tecumseh Nebr
Dr A D Nesbit
Tekamah Nebr
J L Truman
West Hill Nebr
G Treat
Weeping Water Nebr
E G Bruner
West Point Nebr
Mrs C W Le Bar
Wilcox Nebr

**Nevada.**

O B Vincent
Austin Nev
Agent C P R R
Beowawe Nev
G Nicholl
Belmont Nev
J G W Mitchell
Candelaria Nev
Prof C W Friend
Carson City Nev
Sgt D C Grunow
Carson City Nev
W T Crane
(Cranes' Ranch) Elko Nev
D Fowler
Downeyville Nev
J F Cupid
Ely Nev
C H Sproule
Elko Nev
G W Dungan
Genoa Nev
Agent C P R R
Halleck Nev
C F Mengel
Hawthorne Nev.
L Merrill
(Hot Springs)
White Plains Nev
Agent C P R R
Humboldt Nev
Miss Kate Lewers
(Lewers Ranche)
Franktown Nev
S F Reeves
Mill City Nev
N P Dooley
Pioche Nev
Agent C P R R
Palisade Nev
Wm Oothout
Palmetto Nev
Wm E Barney
State Univers'y Reno Nev
Mark Averill
Virginia City Nev
H White (Younts Ranch
Nev) Ivanpah Cal

**New Hampshire.**

F W Palmer
Antrim N H
O F Cole
Berlin Falls N H
Dr Q A Bridges
Berlin Mills N H
W L Foster
Concord N H
N A Briggs
East Canterbury N H
Elmer G Smith
Grafton N H
John M Wilson
Groveton N H
Ag'l Experiment Station
Hanover N H
Dartmouth College Obs'y
Hanover N H
Lake Winipiseogee
Cotton and Woollen M'f'g Co
Lake Village N H
Charles Norse
Littleton N H
W Little
Manchester N H
Jackson Co
Nashua N H
W C Gale
Newton N H
J L Binford
North Conway N H
Miss Helen M Clark
Plymouth N H
N B Waters
Stratford N H
E A Knowlton
Walpole N H
A A Higgins
West Milan N H

**New Jersey.**

R Ross
Asbury Park N J
H Allaire
Allaire N J
Prof C F Richardson
Beverly N J
J H Preston (Billingsport)
Paulsborough N J
H A Jordan
Bridgeton N J
Rev W J Leggett
Belleville N J
L M Dye Jr
Camden N J
Dr J F Leaming
Cape May C H N J
Wm C Harris
Dover N J
H Y Postma
Egg Harbor City N J
H Levy
Franklinville N J
Miss A S Yard
Freehold N J
R N Cornish
Gillette N J
Dr F C Price
Imlaystown N J
Geo. Fleming
Junction N J
Dr G H Larison
Lambertville N J
C W Hockenbury
Locktown N J
J H Eadie
Madison N J
T J Beans
Moorestown N J
John B Collins
Mt Holly N J
W Earle Cass
Newark N J
F W Ricord
Newark N J
Mrs G H Cook
New Brunswick N J
C V Myers
New Brunswick N J
Prof A Scott
New Brunswick N J
Sgt E W McGann
New Brunswick N J
T W Iliff
Newton N J
W Lake
Ocean City N J
Rev S W Knipe
Oceanic N J
I H Bolton
Paterson N J
T Reed
Princeton N J
J Fleming
Readington N J
S Haines
Rancocas N J
Wm Matlach
Salem N J

Dr W J Chandler
South Orange N J
A D Atwood
Tenafly N J
E R Cook
Trenton N J
Wm W Austin
Vineland N J
W T Wilson
Woodbury N J

**New Mexico.**

A Knell
Albert N Mex
W P Metcalf
(Antelope Spring)
via Chilili N Mex
S Parisis
Bernalillo N Mex
E A Sutherland
Chama N Mex
J M Fish
Coolidge N Mex
B Ventura Martinez
Cuba N Mex
M G Burkholder
Embudo N Mex
E A Clemens
Estalina Sps (via)
Magdalena N Mex
Post Surgeon
Fort Bayard N Mex
Post Surgeon Fort Marcy
Santa Fe N Mex
Post Surgeon
Fort Stanton N Mex
Post Surgeon
Fort Union N Mex
Post Surgeon
Fort Wingate N Mex
J E Whitmore
Gallinas Spring N Mex
J E Smith
Hillsborough N Mex
F B Stuart
La Luz N Mex
Richard Pohl
Los Lunas N Mex
E K Caldwell
Monero N Mex
Jose M Vega
Nogal N Mex
Jno Bouquet
Pojuaque N Mex
R H Hills (Red Canon)
Carthage N Mex
Wm L McClure
Taos N Mex

**New York.**

H R Ainsworth M D
Addison N Y
S S Parker
Alabama N Y
Prof F S Place
Alfred Centre N Y
J P Mills
Ampersand, N Y
Miss Etta E Wilcox
Arkwright N Y
J D Tate
Arcade N Y
S C Suydam
Baldwinsville N Y
Dr T S Armstrong
Binghamton N Y
Wm H Ross
Brentwood N Y
Dr F A Winne
Brockport N Y
D B Stillman
Brookfield N Y
Prof W C Peckham
406 Clason ave
Brooklyn N Y
Post Surgeon Fort Porter
Buffalo N Y
Prof H Priest
Canton N Y
Thomas Manning
Carmel N Y
R Sanford Miller
Constableville N Y
G Pomeroy Keese
Cooperstown N Y
Post Surgeon
Davids Island N Y
D C Moon
Dunkirk N Y
Gerity Brothers
Elmira N Y
T P Yates
(Factoryville)
Waverly N Y
Robert Warwick
Fleming N Y
Mrs N S Yates
Geneva N Y
Post Surgeon
Fort Hamilton N Y
T M Younglove
Hammondsport N Y
C H Spaulding
Hess Road Station N Y
James Hyatt
(Honeymead-brook)
Bangall N Y
Chas E Whitney
Humphrey N Y
Mrs Jane Pulver
Italy Hill N Y
Engineering Dept
Cornell University
Ithaca N Y
Prof E A Fuertes
Ithaca N Y
Observer Signal Service
Ithaca N Y
Henry A Stone (Kingston)
Rondout N Y
J H Bailey
Keene Valley N Y
Wm L Annin
Le Roy N Y
C S Rice
Lowville N Y
Edward Hall C E
Lyon Mountain N Y
Dr M A Veeder
P O Box 602 Lyons N Y
F X Straub
Middleburgh N Y
R S Holmes (Marshland)
Apalachin N Y
Albert B Johnson
Malone N Y
S Talcott
Middletown N Y
Edward A Smiley
Minnewaska N Y
J E White
Mt Morris N Y
Director Met'l Observatory
Central Park
New York City
Post Surgeon
Fort Columbus
New York City
G A Yates
New Lisbon N Y
C A Wooster
North Hammond N Y
Chas Fenton
Number Four N Y
N Nelson
Ogdensburgh N Y
J P Davis
Oxford N Y
G H Hudson
Plattsburgh N Y
E B Bartlett (Palermo)
Vermillion N Y
L D Cummings
Palmyra N Y
Prof John M Dolph
Port Jervis N Y
W H Jeffers
(near Perry City)
Trumansburgh N Y
Post Surgeon
Plattsburgh Barracks N Y
G W F Smith
Potsdam N Y
Vassar College Obs'y
Poughkeepsie N Y
J N Tilden
Peekskill N Y
Wm Weaver
Quaker Street N Y
De Witt C Jenkins
Queensbury N Y
Dr H C Sutton
Rome N Y
Post Surgeon
Madison Barracks
Sackett's Harbor N Y
Selah B Strong
Setauket N Y
Rev Charles Simpson
Sherman N Y
James E Wilson
South Canisteo N Y
D C Sharpe
South Kortright N Y
Post Surgeon
Ft Wadsworth Rosebank
Staten Island N Y
Prof H A Peck
Syracuse N Y
R T Church
Turin N Y
Thomas Birt
Utica N Y
George A Fairbanks
Watertown N Y
Rev Dwight W Smith
Watkins N Y
Post Surgeon
Willets Point
Whitestone N Y
Post Surgeon
Military Academy
West Point N Y
Post Surgeon
Fort Schuyler
West Chester N Y
Post Surgeon
Watervliet Arsenal
West Troy N Y
O F Corwin
Wedgwood N Y
Prof O R Willis
White Plains N Y
Post Surgeon
Fort Niagara
Youngstown N Y

**North Carolina.**

Dr Karl von Ruck
Asheville N C
Prof J W Gore
Chapel Hill N C
T B Lindsley
Douglas N C
L Crawford
Franklin N C
Prof Richard H Lewis
Hendersonville N C
Dr T G Harbison
Highlands N C
Dr R L Beall
Lenoir N C
L W Bagley
Littleton N C
Prof S D Bagley
Louisburg N C
Haney & Tiffany
Marion N C
Rev W Q A Graham
Marshallberg N C
Dr P L Murphy (Insane Asy)
Morganton N C
Prof H L T Ludwig
Mt Pleasant N C
J W Ashby
Mt Airy N C
Geo S Wills
Oak Ridge N C
Prof A H Merritt
Pittsborough N C
T C Harris
Raleigh N C
Dr Herbert B Battle
Raleigh N C
Sgt C F von Herrmann
Raleigh N C
Dr G H Saddleson
Southern Pines N C
J A Hedrick
Salisbury N C
R J Noble
Smithfield N C
H L Kimrey
Soapstone Mount N C
T A Clark
Weldon N C
Dr J M Gallagher
Washington N C
H Clay Williams
Willeyton N C

**North Dakota.**

Post Surgeon
Fort A Lincoln N Dak
Post Surgeon
Fort Buford N Dak
Post Surgeon
Fort Pembina N Dak
Post Surgeon
Fort Totten N Dak
Post Surgeon
Fort Yates N Dak
S J Pound
Gallatin N Dak
F L Davies
Grafton N Dak
G S Sprague (University)
Grand Forks N Dak
L C Stanford
Kelso N Dak
Julius H Hoof
Napoleon N Dak
L M P Griswold
New England City N Dak
F R Hill
Steele N Dak
C A McKean
Wahpeton N Dak
Peter Ross
Wild Rice N Dak

**Ohio.**

Dr P H Clark
Ashland Ohio
Prof A D Morrell
Athens Ohio
H V Egbert
Akron Ohio
Frank E Fitch
Bellevue Ohio
P W Barton
Bement Ohio
S M Painter
Bangorville Ohio
E T M Williams
Clarksville Ohio
Post Surgeon
Columbus Barracks
Columbus Ohio
Prof B F Thomas
Columbus Ohio
Sgt C M Strong
Columbus Ohio
G A Hyde
85 Kennard st
Cleveland Ohio
Prof W F McDaniel
Celina Ohio
C F Stokey
Canton Ohio
W H Baker
Ohio State University
Columbus Ohio
B R Ault
Demos Ohio
Mrs Edith E L Boyer
Dayton Ohio
C W Goodspeed
Elyria Ohio
A C Beardsley
Ellsworth Ohio
Prof A C Redding
Findlay Ohio
S M Luther
Garrettsville Ohio
A H Bartle
Granville Ohio
C G Katzenberger
Greenville Ohio
Dr T W Gordon
Georgetown Ohio
W B Longstreth
Gratiot Ohio
D G Lewis
Hassan Ohio
James Bull
Hanging Rook Ohio
Prof G H Colton
Hiram Ohio
Prof N B Hobart
Hudson Ohio
Dr J B Owsley
Jacksonborough Ohio
L J Demarest
Kenton Ohio
J D Hadermann
Leipsic Ohio
Dr James Little
Logan Ohio
W S Dean
Lordstown Ohio
Prof T D Briscoe
Marietta Ohio
E H Raffensberger
Marion Ohio
C H Morris
McConnelsville Ohio
Simon Waterston
Montpelier Ohio
Dr T C Hunter
Napoleon Ohio
Dr A M Beers
New Comerstown Ohio
Jos A Hook
New Alexandria Ohio
H D Gowey
North Lewisburgh Ohio
E U Hyde
Orangeville Ohio
Prof F F Jewett
Oberlin Ohio
Dr D B Cotton
Portsmouth Ohio
Dr D N Allard
Pomeroy Ohio
W N Cowden
Quaker City Ohio
J W Manning
Salineville Ohio
George Olinger
Springborough Ohio
Prof T H Sonnedecker
Tiffin Ohio
Dr A Billhardt
Upper Sandusky Ohio
Prof C W Williamson
Wapakoneta Ohio
E B Michener
Waynesville Ohio
Dr O N Stoddard
Wooster Ohio
Thomas Mikesell
Wauseon Ohio
Prof J Haywood
Westerville Ohio
Dr F Young
Weymouth Ohio
D Lorbach
Waverly Ohio

L S Motte
West Milton Ohio
Mrs E P Wheeler
Wheeler Ohio
A G Frost
Youngstown Ohio

**Oklahoma.**

A R Henderson
Buffalo Okla
Post Surgeon
Fort Reno Okla
Post Surgeon
Fort Sill Okla
Morris Collar
Guthrie Okla

**Oregon.**

John Briggs
Albany Oregon
James W Smith
Arlington Oregon
F L Carter
Ashland Oregon
Geo Bennett
Bandon Oregon
T L Arnold
Beulah Oregon
State Agr'l College
Corvallis Oregon
U S Engineer Officer
Cascade Locks Oregon
John Macdonald
Deer Island Oregon
Thos Pearce
Eola Oregon
Dr G Wigg
East Portland Oregon
Prof S E McClure
State University
Eugene Oregon
Prof G W Shaw
Forest Grove Oregon
J S Gray
Gardiner Oregon
F S Moore
Gold Beach Oregon
J B Paddock
Grant's Pass Oregon
J H Neal
(Happy Valley)
Diamond Oregon
Mrs E E Bleakman
Hardman Oregon
A Smith
Heppner Oregon
W H Goudy
Hubbard Oregon
Dr P G Barrett
Hood River Oregon
P Britt
Jacksonville Oregon
J D McCully
Joseph Oregon
S C Beach
Lake View Oregon
W H Colwell
Lone Rock Oregon
J K Romig
La Grande Oregon
Rev Dr Urban Fisher S J
Mount Angel Oregon
Capt W Harris
McMinnville Oregon
Sgt B S Pague
Portland Oregon
P Zahnes
Pendleton Oregon
F M Chrisman
(Silver Lake)
Prinville Oregon
W C Cusick
Telocaset Oregon
S L Brooks
The Dalles Oregon
Dr H W Vincent
Toledo Oregon
G W Dalles
Vernonia Oregon
M A Baker
Weston Oregon

**Pennsylvania.**

Dr C B Dudley
Altoona Pa
J Grathwohl
Blooming Grove Pa
A H Boyle
Blue Knob Pa
M H Boye
Coopersburgh Pa
J E Pague
Carlisle Pa
Prof C M Thomas
Clarion Pa
R M Graham
Catawissa Pa
Miss Mary A Ricker
Chambersburg Pa
Miss E A G Apple
Charlesville Pa
Wm Loveland
Corry Pa
W T Gordon
Coatesville Pa
H D Miller
Drifton Pa
Theo Day
Dyberry Pa
T H Walton
Doylestown Pa
C F Sweet
Edinborough Pa
T B Lloyd
Emporium Pa
E S Chase
Eagle's Mere Pa
Dr J W Moore
Easton Pa
G W Wood
Frederick Pa
J C Hilsman
(Forks of Neshaminy)
Rush Valley Pa
Prof S H Miller
Greenville Pa
E C Wagner
Girardville Pa
N Moore
Grampian Hills Pa
Dr T B Orchard (Salem Cor)
Hamlinton Pa
Prof F P Leavenworth
Haverford College Pa
Prof W J Swigart
Huntingdon Pa
Prof J A Stewart
Hollidaysburgh Pa
John Torrey
Honesdale Pa
S C Schumacker
Indiana Pa
E C Lorentz
Johnstown Pa
B P Kirk
Kennett Square Pa
R J Mickey
Kilmer Pa
F O Whitman
Lewisburgh Pa
H L Shull
Lansdale Pa
Lewis T Lampe
Lancaster Pa
G W Hayes
Lebanon Pa
J T Ambrose
Ligonier Pa
O V Metzger
(Aqueduct) Logania Pa
Prof J A Robb
Lock Haven Pa
Geo W T Warburton
Le Roy Pa
J & B H Metcalf
Meadville, Pa
J J Boyd
Mauch Chunk Pa
Thos F Sloan
McConnellsburgh Pa
Stephen S Jenkins
Meshoppen Pa
W T Butz
New Castle Pa
J S Gibson
Nisbet Pa
Dr Geo M Grim
Ottsville Pa
J D Brennan
Pleasant Mount Pa
Chas Moore
Pottstown Pa
Post Surgeon
Allegheny Arsenal
Pittsburgh Pa
Frank Costin
Petersburgh Pa
John E Codman
Bureau of Water
Philadelphia Pa
John Comley
1529 Centennial Ave
Philadelphia Pa
Post Surgeon
Frankford Arsenal
Philadelphia Pa
Sgt T F Townsend
Philadelphia Pa
Franklin Institute
Philadelphia Pa
Knowles Croskey
Phœnixville, Pa
R C Stover
Point Pleasant Pa
J L Heacock
Quakertown Pa
Rev W W Deatrich
Rimersburgh Pa
Geo Lowder
(Smith's Corners)
Point Pleasant Pa
Armstrong & Brownell
Smethport Pa
W M Schrock
Somerset Pa
J M Boyer
Selin's Grove Pa
Prof Susan J Cunningham
Swarthmore Pa
Prof Wm Frear
State College Pa
B M Hall
South Eaton Pa
J A Roth
Seisholtzville Pa
Rev M Gustin
Troy Pa
Wm Hunt
Uniontown Pa
A W Batterly
Wilkes Barre Pa
Dr J C Green
West Chester Pa
H D Deming
Wellsborough Pa
Chas Beecher
Wysox Pa
Prof W F Wickersham
Westtown Pa
Mrs L H Grenewald
York Pa

**Rhode Island.**

N G Herreshoff
Bristol R I
N Helme
Kingston R I
Agr Exp Station
Kingston R I
G W Pratt
Lonsdale R I
Post Surgeon
Fort Adams Newport R I
Thos Dunn
Newport R I
C H Cannon
Olneyville R I
J H Walker
Pawtucket R I
Office City Engineer
Providence R I
Ladd Observatory
Providence R I
D W Hoyt
Providence R I

**South Carolina.**

P W Scott
Brewer Mine S C
W G Peterson (Belmont)
Newberry S C
W R Godfrey
Cheraw S C
Hon A P Butler
Columbia S C
Observer Signal Service
Columbia S C
M P Daggett
Conway S C
J W Earl (Evergreen)
Holland's Store S C
W J Evans
Hardeeville S C
C B Webb
Jacksonborough S C
Colin Macrae (Kirkwood)
Camden S C
H D Elliott
Port Royal S C
Dr W W Anderson
Statesburgh S C
E Gillard
Trial S C
J Pagan
Winnsborough S C
H G Reid
Walhalla S C
J R Schorb
Yorkville S C

**South Dakota.**

A H Olwin
Aberdeen S Dak
W S Hill
Alexandria S Dak
Prof Louis McLouth
Brookings S Dak
Wm M Cuppett
Canton S Dak
W H Boals
Clark S Dak
Thomas H Ruth
De Smet S Dak
Isaac Killian
Elkton S Dak
F J Cross (Cross)
Etta Mine S Dak
Post Surgeon
Fort Bennett S Dak
Post Surgeon
Fort Meade S Dak
Post Surgeon (Fort
Randall) Armour S Dak
Post Surgeon
Fort Sully S Dak
G A Perly
Flandreau S Dak
W W Butler
Highmore S Dak
W J Harding
Howard S Dak
Sgt S W Glenn
Huron S Dak
A S Stuver
Kimball S Dak
D W Diggs
Milbank S Dak
J W Strouse
Oelrichs S Dak
Mrs M F Goddard
Onida S Dak
J S Headley
Parkston S Dak
E S Carter
Sioux Falls S Dak
J H Warren
Spearfish S Dak
S C Butterfield
St Lawrence S Dak
T H Garry
Vermillion S Dak
G W Fink
Wolsey S Dak

**Tennessee.**

J K P Wallace
Andersonville Tenn
Rev C F Williams
Ashwood Tenn
P B Calhoun
Austin Tenn
G W Martin
(Missionary Ridge)
822 Cherry Street
Chattanooga Tenn
J I Hall
Covington Tenn
A A Arthur
Cumberland Gap Tenn
Prof J A Lyons
Clarksville Tenn
Miss Belle Baker
Dare Tenn
L Boynton
Dunlap Tenn
C F Vanderford
Florence Station Tenn
J C Diemer
Fayetteville Tenn
Dr John A Campbell
Franklin Tenn
W H Brown
Greeneville Tenn
R Downey
Hohenwald Tenn
W C Hall
Jacksboro Tenn
Prof C W Marsh
Johnson City Tenn
W J Inman
Kingston Springs Tenn
J H Burrow
Lynnville Tenn
A B Ewing
Lewisburgh Tenn
C Hawkins
McKenzie Tenn
Fred T Fisher
McMinnville Tenn
Dr J D Plunket
Nashville Tenn
Sgt H C Bate
Nashville Tenn
W C Thompson
Nunnelly Tenn
J C Williamson
Parksville Tenn
Dr W F G Wilson
Rugby Tenn
F K Fergusson
Riddleton Tenn
Miss C M Nugent
Rogersville Tenn
W J Breeding
Spring Dale Tenn
B P Fagan
Sharp Tenn
A S Curry
Trenton Tenn
Miss Nora Williams
Union City Tenn
Dr C Buchanan
Waynesborough Tenn

**Texas.**

C F Mercer
Arlington Tex
Oscar Samostz
Austin Tex

Dr Q C Smith
Austin Tex
K D Blankinship
Berlin Tex
A D Oliver
Big Spring Tex
J G Sloan
Brenham Tex
W H Potter (Bear Creek)
Brady Tex
H Stevens
Brazoria Tex
Prof C S Newhall
Brownwood Tex
W G Minor
Coldwater Tex
F R Blount
Colorado Tex
W M Spitler
Burnett Tex
J S Rogers
Columbia Tex
Prof Duncan Adriance
College Station Tex
W H Hamilton
Box 169 Corsicana Tex
E L Gibson
Corsicana Tex
G H Chipman
Childress Tex
F R Gillette
Dallas Tex
Anthony Blum
Durham Tex
J C Edgar
Duval Tex
H Graves
Epworth Tex
J N Morris
Forestburgh Tex
A Striegler
Fredericksburgh Tex
Jas G Mallette
Ft Worth Tex
Post Sugeon
Ft Bliss El Paso Tex
Post Surgeon
Ft Brown Brownsville Tex
Post Surgeon
Ft Clark Brackettville Tex
Post Surgeon
Fort Davis Tex
Post Surgeon
Del Rio Tex
Post Surgeon
Ft Eagle Pass Tex
Post Surgeon
Ft Hancock Tex
Post Surgeon
Ft McIntosh Laredo Tex
Post Surgeon
Camp Pena Colorado
Marathon Tex
Post Surgeon Ft Ringgold
Rio Grande City Tex
D T Ragsdale
Gainesville Tex
Lum Woodruff
Gallinas Tex
D D Bryan
Galveston Tex
Sgt I M Cline
Galveston Tex
A B Gant
Graham Tex
W J Crowley
Grapevine Tex
Chas W Croft
Hansford Tex
P D Sanders
Haskell Tex
D R Sanders
Houston Tex
W T Barr
Huntsville Tex

Hugo Lehman
La Grange Tex
Dr C M Ramsdell
Lampasas Tex
G W Krech
Longview Tex
J E Fisher
Luling Tex
S G Lackey
Mesquite Tex
J L Vaughan
Merkel Tex
Louis Runge
Menardville Tex
Dr J C Riley
Mountain Spring Tex
Capt Julius Geisecke
New Braunfels Tex
C Runge
New Ulm Tex
Miss Carrie Roberts
Panhandle Tex
E H Snider
Panter Tex
Hamilton Foster
Roby Tex
Thos Wood
Round Rock Tex
Chas R Brown
San Angelo Tex
Post Surgeon
San Antonio Tex
Postmaster
Sierra Blanca Tex
C M Tilford
(Silver Falls)
Mt Blanco Tex
A C Wilmuth
Snyder Tex
W Goodrich Jones
Temple Tex
Charles T Mercer
Venus Tex
L F Haller
Victoria Tex
W H Godber
Waco Tex
W B Slack
Weatherford Tex
Dr O Eastland
Wichita Falls Tex

**Utah.**

H C Wallace
Alta Utah
Miss Hattie E Farnsworth
Beaver Utah
Post Surgeon
Fort Du Chesne Utah
B F Cooke
Grouse Creek Utah
F Blumel
Lake Park Utah
William Brown
Levan Utah
J W Sanborn
Logan Utah
J H Walker
Utah Exp Sta
Logan Utah
E Caffall
Losee Utah
R Moncur
Mt Carmel Utah
H C Davidson
Mt Pleasant Utah
H Crouse
Moab Utah
W R May
Nephi Utah
W W Crossman
Ogden Utah
Miss Mary Ferguson
Park City Utah
Alex Matheson
Parowan Utah

T H Martin
Provo City Utah
N Anderson
Richfield Utah
Seth A Pymm
St George Utah
Post Surgeon
Fort Douglas
Salt Lake City Utah
J Robbins
Snowville Utah
James Hughes
Stockton Utah
Isaac S Goodwin
Teardale Utah

**Vermont.**

W H Childs
Brattleboro Vt
H B Chamberlain
Brattleboro Vt
W B Gates
55 Elmwood Avenue
Burlington Vt
H L Bixby
Chelsea Vt
C H Lane
Cornwall Vt
H B Lovering
East Berkshire Vt
Rev A Hazen
Hartland Vt
J W Hatch
Jacksonville Vt
Dr H A Cutting
Lunenburgh Vt
Maj W O Cartwright
Saxton's River Vt
H F J Scribner
Strafford Vt
A Whitehead
Vernon Vt
B H Albee
Weathersfield Vt

**Virginia.**

J W Fox Sr
Big Stone Gap Va
W N Stone
Bedford City Va
C R Moore
Birdsnest Va
G F Eakle
Bolar Va
George Williams
Casanova Va
W W Ragan
Christiansburgh Va
J A Thompson
(Yancey's Mill) Crozet Va
D A Heatwole
Dale Enterprise Va
Post Surgeon
Fort Monroe Va
Post Surgeon
Fort Myer Va
Washington D C
Prof H D Campbell
Lexington Va
A T Lincoln
Marion Va
R V Gaines
Mossing Ford Va
G Dunn
Nottoway Va
Prof J M Colson Jr
Petersburgh Va
W H Pleasants
Richmond Va
Prof S C Wells
Salem Va
W N Parrott
Stanardsville Va
W C Hedrick
Staunton Va
J R Sim
Summit Va

H G Wadley
Wytheville Va

**Washington.**

F A Hart
Aberdeen Wash
R M Hoskinson
(Blakely) Madrone Wash
W H Mossman
Chehalis Wash
R C Willis
Doe Bay Wash
S R S Gray
East Sound Wash
D Pullen
Lapush Wash
Post Surgeon
Fort Canby Wash
care Astoria Oregon
Dr A Wilgus
Fort Simcoe Wash
Post Surgeon
Fort Spokane
Miles Wash
Post Surgeon
Fort Townsend
Port Townsend Wash
H S Channing
Cor 6th & Spring sts
Seattle Wash
C P Culver
Tacoma Wash
Post Surgeon
Vancouver Barracks Wash
Mrs C B Carpenter
Vashon Wash
Post Surgeon
Fort Walla Walla Wash
R W Starr
Waterville Wash

**West Virginia.**

H A Evans
Alderson W Va
Henry Resseger
Ella W Va
S L Zinn
Gladesville W Va
L F Miars (Mt Alto)
Hartmonsville W Va
J E Murdock
Kingwood W Va
D Titchenell
Pleasant Hill W Va
F M Swann
Tyler's Creek W Va
G H Trembly
Tannery W Va

**Wisconsin.**

Herman F Lueder
Appleton Wis
H B Hubbell
Beaver Dam Wis
J R Brown
Berlin Wis
Prof C A Bacon
Beloit Wis
John J Metzgar
Butternut Wis
B C Curtis
Cadiz Wis
R C Worthington
Centralia Wis
John Erb
Columbus Wis
W R Collie
Delavan Wis
Joseph G Lawton
De Pere Wis
J R Slonaker
Elroy Wis
A Combacker
Ellsworth Wis
J E Breed
Embarrass Wis
W N Sloane
Eau Claire Wis

J C Wedge
Fond du Lac Wis
H M Crombie
Glasgow Wis
Dr H J Thomas
Greenwood Wis
W J Egbert
Hammond Wis
Horatio C Flagg
Hayward Wis
E V Wernick
Hillsborough Wis
J A McIntosh
Honey Creek Wis
J D Wiltrout
Hudson Wis
A L Hatch
Ithaca Wis
E B Heimstreet
Janesville Wis
N A Pennoyer
Kenosha Wis
Edward Pollock
Lancaster Wis
A J Looze
Lincoln Wis
Washburn Observatory
Madison Wis
Miss Johanna Lups
Manitowoc Wis
C H Grole
Mauston Wis
J H Treat
Meadow Valley Wis
Dr F Robert Zeit
Medford Wis
A Pillsbury
Menomonie Wis
Wm Heaslett
Neillsville Wis
W K Smith
Oconto Wis
Prof G M Browne
Oshkosh Wis
Rev E M Corey
Peshtigo Wis
F W Sackett
Phillips Wis
Robert Barnsdale
Plover Wis
Miss Ida Sutter
Portage Wis
L Cornelius
Prairie du Chien Wis
E S Koepenick
Koepenick Wis
C W Guldager
Rhinelander Wis
C Rice
Wauzeka Wis
H Scott
Whitehall Wis

**Wyoming.**

Wm Werner
Fort Fetterman Wyo
Dr L S Barnes
Laramie Wyo
F S Lusk
Lusk Wyo
J F Crawford
Saratoga Wyo
M R Johnston
Wheatland Wyo
Post Surgeon
Fort Russell Wyo
Post Surgeon
Fort McKinney Wyo
Post Surgeon
Camp Pilot Butte
Rock Springs Wyo
Post Surgeon
Fort Sheridan
Mammoth Hot Springs Wyo
Post Surgeon
Fort Washakie Wyo

*List of merchant marine steam and sailing vessels from which International Meteorological reports were received at the office of the Chief Signal Officer, U. S. Army, Washington City, for the three months ending March 31, 1891.*

| | Name of vessel. | Captain. |
|---|---|---|
| Br. | s. s. Actor | D. James. |
| Am. | Adirondack | J. W. Sansom. |
| Br. | Adriatic | E. J. Smith. |
| | Adventure | Thos. Dixon. |
| Nor. | Agnes | F. Hansen. |
| Br. | Aguan | W. K. Baillie. |
| | Ailsa | J. W. Morris. |
| | Alameda | H. G. Morse. |
| | Alcides | W. Rollo. |
| | Alene | E. J. Seiders. |
| Am. | Algonquin | J. McKee. |
| Br. | Alexander Elder | R. Boutcher. |
| Ger. | Allemannia | Geo. Thiele. |
| Nor. | Alfred Dumois | L. Christie. |
| | Aller | H. Christoffers. |
| Am. | Alliance | D. C. Griffiths. |
| Br. | Alps | E. C. Legg. |
| | Alpha | N. Hall. |
| | Alvena | F. McKay. |
| | Alvo | D. Williams. |
| | Ambrose | H. J. P. Smith. |
| Ger. | America | W. Kohlmann. |
| Dtch. | Amsterdam | A. Potjer. |
| Br. | Anchoria | James Harris. |
| | Andean | H. Daniel. |
| | Anerley | W. T. Sherborne. |
| | Angers | J. Pinkham. |
| | Apollo | T. Sykes. |
| | Adancorrache | W. Anderson. |
| | Assyrian | J. Bentley. |
| | Aston Hall | S. Sawle. |
| | Athos | H. Low. |
| | Aurania | H. Walker. |
| Br. | Baltimore | C. W. Simpson. |
| Nor. | Banes | J. Kuding. |
| Br. | Barrowmore | W. H. Morse. |
| | Bayonne | J. E. Payne. |
| | Bede | W. Anderson. |
| Belg. | Belgenland | E. Bence. |
| Br. | Belgic | W. H. Walker. |
| | Belgravia | G. C. Boothby. |
| | Bellona | James McMillan. |
| | Bentala | J. Campbell. |
| Span. | Benita | L. Santaulari. |
| | Benito Estenger | E. F. Canal. |
| | Berrita | |
| Ger. | Bohemia | F. Schroeder. |
| Br. | Blue Jacket | J. A. Paull. |
| | Borderer | F. Manley. |
| Fr. | Borussia | H. Tagemann. |
| Br. | Bostonian | R. Leask. |
| | Bothnia | J. B. Watt. |
| | Boston City | H. W. Pell. |
| | Bremerhaven | C. Schmidt. |
| | Bretwalda | Thos. Hunter. |
| | Britania | J. Brown. |
| | Britannic | R. Nicol. |
| | British Crown | H. W. Williams. |
| | British Empire | R. Wills. |
| | British Prince | S. Nowell. |
| | British Princess | E. H. Freeth. |
| | British Queen | A. Smith. |
| | Brooklyn City | H. W. Barclay. |
| | Brunel | J. W. Henderson. |
| | Buffalo | J. H. Malet. |
| | Caledonia | John McAmbie. |
| | California | R. T. Garvie. |
| | Californian | J. W. Pickthall. |
| Ger. | Capua | F. Sperling. |
| Br. | Carthaginian | A. McNicol. |
| | Caspian | R. P. Moore. |
| Ger. | Cassius | C. Rix. |
| Br. | Castlegate | T. M. Milne. |
| Ger. | Catania | H. M. Franck. |
| Br. | Celtic | R. Nicol. |
| | Cephalonia | W. S. Seccombe. |
| Am. | Chalmette | J. B. Percy. |
| Br. | Charloes | P. M. Peters. |
| Fr. | Chateau Lafite | T. Chabot. |
| Br. | Chester | H. Tell. |
| | Chicago | T. R. Watson. |
| | Christine | M. Schmidten. |
| Br. | Circassia | J. Hedderwick. |
| | Circassian | A. McDougall. |
| | Circe | R. C. Jennings. |
| | Circassian Prince | J. F. Pearn. |
| Am. | City of Augusta | J. W. Catherine. |
| Br. | City of Berlin | F. S. Land. |
| | City of Chester | A. W. Lewis. |
| | City of Chicago | A. Redford. |
| | City of Lincoln | N. Steel. |
| | City of New York | Fred. Watkins. |
| Am. | City of Para | J. L. Lockwood. |
| | City of Savannah | C. B. Googins. |
| Br. | City of Truro | G. Fulcher. |
| | Claribel | T. M. MacKnight. |
| Am. | Colorado | W. F. Evans. |
| Br. | Colorado | W. Abbott. |
| | Columbia | R. Garrick |
| | Congo | B. H. Rogers. |
| | Columbian | E. Parry. |
| | Connemara | W. Boulton. |
| | Cosmopolitan | F. Corner. |
| | Corean | J. Harrison. |
| | Craigmore | R. S. Parry. |
| | Croma | W. R. Lord. |
| Am. | Czarina | H. Bermpohl. |
| Br. | Damara | Wm. Lynas. |
| Nor. | Dana | M. Michilsen. |
| Ger. | Dania | W. Kuhlewein. |
| Br. | s. s. Darial | A. H. F. Young. |
| | Darwin | T. Byrne. |
| | Denmark | R. S. Rigby. |
| Belg. | De Ruyter | J. J. Brevens. |
| Br. | Devonia | Jno. Craig. |
| | Dora Foster | J. Shawyer. |
| | Dorian | P. Donnelly. |
| | Dunmore | A. J. Campbell. |
| Fr. | Dupuy de Lome | S. Dechaille. |
| Br. | Durham City | J. A. Jacobsen. |
| | Earnwell | C. N. Mumford. |
| Dtch. | Edam | G. Stenger. |
| | Edith Howe | T. Foley. |
| Br. | Edwin | T. Matthews. |
| | Egyptian Monarch | T. M. Irvin. |
| Ger. | Eider | H. Baur. |
| | Elbe | C. Thalenhorst. |
| Am. | El Dorado | H. J. Byrne. |
| Fr. | Electrique | P. Charles. |
| Br. | Elfrida | W. Rasmussen. |
| | Elihu Thompson | T. W. Garlick. |
| Am. | El Mar | G. W. Mason. |
| Br. | Elmfield | W. Bowen. |
| Am. | El Monte | R. B. Quick. |
| Br. | Elmville | J. Dove. |
| Ger. | Elsie Marie | H. Hinsch. |
| Br. | Elton | R. Campbell. |
| | Elvaston | W. E. Steele. |
| Ger. | Empress | T. Rigden. |
| | Ems | R. Sander. |
| Br. | England | A. F. Heeley. |
| | Enskar | A. H. Kneebone. |
| It. | Entella | V. Bruno. |
| Fr. | Equateur | A. Moreau. |
| Br. | Erl King | Henry Jones. |
| | Ethiopia | H. Young. |
| | Etruria | W. H. P. Hains. |
| Span. | Euskaro | M. Zabalandicoechea. |
| Br. | Exeter City | T. L. Weiss. |
| Am. | Excelsior | H. L. Higgins. |
| Br. | Federation | A. M. Morris. |
| Span. | Federico | A. Forugia. |
| Br. | Fitzroy | W. Sanderson. |
| | Fonar | T. H. Willis. |
| | France | A. D. Hadley. |
| Ger. | Frankfurt | W. Badenstedt. |
| Belg. | Friesland | W. G. Randle. |
| Br. | Frisco | J. R. Baker. |
| Ger. | Fulda | R. Ringk. |
| Br. | Gaelic | W. G. Pearne. |
| Ger. | Galicia | W. Bocke. |
| Br. | Galileo | W. Magee. |
| Span. | Gallego | Arribalzaga. |
| Br. | Gallia | J. Ferguson. |
| Ger. | Gellert | C. Kaempff. |
| Br. | Germanic | J. G. Cameron. |
| | Gilsland | M. L. Robinson. |
| | Gleneagles | E. F. Park. |
| | Glenfield | J. Newdick. |
| | Gloucester City | R. Jones. |
| Ger. | Gluckauf | Szymanski. |
| Ger. | Graf Bismarck | W. Topser. |
| Br. | Grecian | C. E. Le Gallais. |
| | Greece | A. J. Jeffrey. |
| Ger. | Gut Heil | B. Wischbausee. |
| | Habsburgh | G. Thurman. |
| | Hafis | P. Hinch. |
| Br. | Hallomshire | G. T. Alleyne. |
| | Hampstead | E. Jones. |
| Ger. | Hans & Kurt | Carl Hoelck. |
| | Havel | T. Tungst |
| | Haytian | J. Coward. |
| Dan. | Hekla | A. G. Thomsen. |
| Ger. | Heligoland | A. Buhner. |
| | Hermann | H. Burns. |
| Br. | Hexham | T. D. Adams. |
| | Hibernia | W. E. McDowell. |
| | Hibernian | J. M. Wallace. |
| | Hindoo | Jas. Douglas. |
| | Holland | Thos. Foote. |
| Ger. | Hohenzollern | A. von Collen. |
| Br. | Hopetown | R. Sanpher. |
| Span. | Hugo | A. Garteiz. |
| Br. | India | B. Jamieson. |
| | Illyd | Chas. E. Pain. |
| Am. | Indiana | W. J. Boggs. |
| It. | Iniziativa | A. Canzoneri. |
| Br. | Inchboroa | W. Ashley. |
| | Intrepid | P. S. Hodge. |
| | International | A. S. Hewitson. |
| | Inventor | J. Black. |
| | Iowa | E. W. Owen. |
| Dan. | Island | W. Skjodt. |
| Ger. | Italia | —— Renter. |
| Br. | Italy | A. D. Hadley. |
| | Ixia | W. Churnside. |
| | Jamaician | D. Lawson. |
| | Jersey City | A. Sendall. |
| | Kansas | A. Fenton. |
| Rus. | Kasbek | C. R. Briggs. |
| Ger. | Karlsruhe | F. Kessler. |
| | Kehrweider | W. Leidig. |
| Br. | Kepler | P. H. Tanner. |
| Ger. | Kronprinz F. Wilhelm | M. v. d. Decken. |
| Fr. | La Bourgogne | A. Leboeuf. |
| | La Bretagne | —— Collier. |
| Belg. | La Campine | E. Smit. |
| Fr. | La Champagne | L. Boyer. |
| Br. | La Flandre | M. W. Ninnes. |
| Fr. | La Gascogne | S. Santelli. |
| Ger. | s. s. Lahn | T. Mirow. |
| Br. | Lake Huron | P. D. Murray. |
| | Lake Winnipeg | F. Carey. |
| Am. | Lampasas | M. B. Crowell. |
| Fr. | La Normandie | G. Collier. |
| Span. | Leonora | D. Kohlenbeck. |
| It. | Letimbro | M. Di Marco. |
| Br. | Lisnacrieve | Fred. R. Evans. |
| | Llandaff City | W. Fitt. |
| | Loango | R. Carruthers. |
| | Lochmore | R. E. Jepson. |
| | Lord Clive | P. Urquhart. |
| | Lord Gough | E. M. Hughes. |
| | Lord O'Niel | A. Ferris. |
| Am. | Louisiana | E. V. Gager. |
| Br. | Ludgate Hill | J. Brown. |
| | Lydian Monarch | C. W. Morgan. |
| Ger. | Maasdam | A. Potjer. |
| —— | Maggie Dixon | J. M. Donald. |
| Br. | Maine | H. Bocquet. |
| | Majestic | H. Parsell. |
| | Manhattan | I. B. Robinson. |
| | Manitoban | J. M. Johnston. |
| | Marengo | W. Whitton. |
| Ger. | Marian | H. Grahl. |
| | Marsala | N. Maass. |
| Br. | Martello | W. Rae. |
| | Maryland | G. W. Flowers. |
| | Mentmore | R. Waite. |
| | Methley Hall | I. Wilcox. |
| | Michigan | S. Walters. |
| | Minia | S. Trott. |
| Ger. | Ministeo Maybach | B. Schierhorst. |
| Br. | Minnesota | R. Griffiths. |
| | Missouri | A. J. Cave. |
| | Monkseaton | J. N. Beasley. |
| | Montana | S. Layland. |
| | Mississippi | H. Murrell. |
| Ger. | Moravia | O. Winkler. |
| Am. | Mount Edgecomb | J. Witherell. |
| Ger. | Munchen | A. Stencken. |
| Span. | Navarro | S. de Felleria. |
| Belg. | Nederland | H. E. Nickels. |
| Br. | Nedjed | A. Newey. |
| Am. | Neptune | J. Fraser. |
| Br. | Nessmore | J. Baxter. |
| Fr. | Neustria | —— Briand. |
| Br. | Nevada | J. A. R. Cushing. |
| Am. | Newport | C. C. Lima. |
| Belg. | Noordland | H. E. Nickels. |
| Br. | Norseman | D. H. Stembridge. |
| | Northgate | W. Ramsdale. |
| | Norwegian | W. Christie. |
| Ger. | Nurnberg | H. Engelbart. |
| Br. | Nyassa | J. Limond. |
| Dtch. | Obdam | —— Rogeveen. |
| Ger. | Ocean | A. Voge. |
| Br. | Oceanic | W. W. Smith. |
| Am. | Ohio | R. W. Sargent. |
| Ger. | Ohio | A. Dehle. |
| Br. | Ohio | S. W. Wilson. |
| | Ontario | W. P. Couch. |
| Dtch. | Orange Nassau | T. Sorgdrager. |
| Br. | Oranmore | W. J. Moffat. |
| | Orkla | J. T. Sutherland. |
| | Oregon | J. McAuley. |
| | Orinoco | J. S. Garvin. |
| Am. | Orizaba | J. McIntosh. |
| Br. | Ottoman | E. Maddox. |
| Hay. | Ozama | C. O. Rockwell. |
| Br. | Palestine | W. Whiteway. |
| | Palmas | J. Evans. |
| Fr. | Paris | F. Chevalier. |
| Br. | Parisian | J. Ritchie. |
| | Parkmore | A. Hawkett. |
| Am. | Pascal | R. W. Trenaman. |
| Ger. | Paula | F. Wienefield. |
| Br. | Pavonia | A. McKay. |
| Dtch. | P. Caland | F. S. de Vries. |
| Br. | Patapsco | P. L. Moore. |
| | Pawnee | E. Phillips. |
| | Peconic | W. Harnden. |
| Belg. | Pennland | H. Buschmann. |
| Br. | Peruvian | —— Newman. |
| | Picqua | J. T. Lund. |
| | Pocahontas | J. James. |
| | Pocasset | John Jenkins. |
| Ger. | Polaris | —— Busch. |
| | Polynesia | G. Franck. |
| Br. | Pommeranian | W. Dalziel. |
| | Pontiac | R. Blythe. |
| Am. | Portia | T. Ash. |
| Ger. | Preussen | W. Beimkasten. |
| Dtch. | Prins Wm. II | J. T. Dorr. |
| | Prins Wm. III | H. Stiviter. |
| | Prins Fred. Hendrik | G. B. Stroink. |
| | Prins Maurits | F. Karst. |
| Br. | Prior | G. Graham. |
| | Professor | R. Owen. |
| | Prudentia | C. Stannard. |
| | Prussian | C. H. Calvert. |
| | Queensmore | J. Trenery. |
| | Recta | J. R. Lowe. |
| | Red Sea | C. Baker. |
| Ger. | Rhaetia | W. Kuhlwein. |
| Belg. | Rhynland | R. Wyer. |
| Br. | Rialto | J. Akester. |
| | Richmond | E. S. Clapp. |
| | Richmond Hill | H. Perry. |
| | Robert Dickinson | H. Tucker. |

*List of merchant marine steam and sailing vessels from which International Meteorological reports were received at the office of the Chief Signal Officer, U. S. Army, Washington City, for the three months ending March 31, 1891*—Continued.

| | Name of vessel. | Captain. |
|---|---|---|
| Br. | s. s. Rochdale | F. D. Tindall. |
| | Rock Light | F. Parton. |
| | Roman | R. Williams. |
| | Rossend Castle | J. H. Harris. |
| | Rosshire | W. Hewat. |
| | Rossmore | John Arnold. |
| Dtch. | Rotterdam | H. C. v. d. Zee. |
| Ger. | Rugia | C. Kaempff. |
| Br. | Runic | E. J. Smith. |
| Ger. | Russia | G. Schmidt. |
| Br. | Rydal Holmes | W. Brown. |
| Ger. | Saale | H. Richter. |
| Br. | St. Pancras | O. R. Young. |
| | Saint Ronans | H. Campbell. |
| Am. | Saginaw | R. B. Kelly. |
| Nor. | Sama | H. M. Hansen. |
| Br. | Samaria | T. Hewitson. |
| Am. | San Benito | H. P. Conner. |
| | Saratoga | C. P. Leighton. |
| Br. | Sardinian | W. Richardson. |
| | Sarmatian | J. Brown. |
| | Sarnia | J. Gibson. |
| Ger. | Scandia | E. Kopff. |
| Am. | Seneca | F. Stevens. |
| Span. | Serra | F. de Luzzaraga. |
| Br. | Servia | H. Walker. |
| | Siberian | J. Park. |
| Ger. | Slavonia | H. Schmidt. |
| Br. | Smeaton Tower | J. W. Godfrey. |
| | Southerly | J. G. Savilli. |
| Ger. | Spaarndam | F. H. Bonjer. |
| Br. | Spain | W. A. Griffiths. |
| | Specialist | C. H. Hassack. |
| Ger. | Spree | W. Willigerod. |
| Br. | Standard | W. Langer. |
| | State of Indiana | A. Ritchie. |
| | State of Nevada | J. A. Stewart. |
| | State of Pennsylvania | A. J. A. Mann. |
| | Stockholm City | W. Thompson. |
| | Straithairly | W. Wynne. |
| | Stranton | G. Morrison. |
| It. | Stura | F. Valle. |
| Ger. | Stuttgart | W. v. Schumann. |
| | Suevia | C. Ludwig. |
| Belg. | Switzerland | A. Mille. |
| Ger. | Taormina | G. Koch. |
| | Teutonia | J. Marsen. |
| Br. | Teutonic | H. Davison. |
| | Texan | T. T. King. |
| | The Queen | T. P. Heeley. |
| Dan. | Thingvalla | S. T. H. Laub. |
| Br. | Tower Hill | R. Bennett. |
| Ger. | Trave | R. Bussius. |
| Br. | Trinacria | G. Mitchell. |
| | Trinidad | G. Mitchell. |
| | Umbria | H. McKay. |
| | Urbino | James Warren. |
| — | Utopia | R. Morrison. |
| Br. | Vancouver | H. C. Williams. |
| | Vandyck | T. Phelan. |
| Dtch. | Veendam | A. Roggeveen. |
| Br. | Venetian | A. W. Bell. |
| — | Vesta | I. Corbishley. |
| Nor. | Viking | F. Hastund. |
| Fr. | Ville de Donai | — Dependant. |

| | Name of vessel. | Captain. |
|---|---|---|
| Br. | s. s. Virginian | M. Fitt. |
| Belg. | Waesland | C. H. Grant. |
| Br. | Wallachian | W. Croskery. |
| — | Wandrahen | — |
| Br. | Waterloo | J. P. Turner. |
| | Wells City | T. H. Gore. |
| Dtch. | Werkendam | W. Bakker. |
| Ger. | Werra | C. Pohle. |
| Belg. | Westernland | J. C. Jamison. |
| Ger. | Weser | H. Winter. |
| | Wiesland | R. Karlowa. |
| Br. | Wild Flower | S. W. Ryder. |
| | William Cliff | C. Winder. |
| Ger. | Willkommen | T. Schaffer. |
| Br. | Winchester | J. B. Woolley. |
| | Wisconsin | J. P. Worrel. |
| | Wyoming | C. L. Rigby. |
| | Yorkshire | O. J. H. Arnold. |
| Am. | Yucatan | J. W. Reynolds. |
| | *United States Naval.* | |
| U. S. S. | Alert | R. D. Hitchcock. |
| U. S. C. S. S. | A. D. Bache | E. Hughes. |
| U. S. S. | Boston | G. C. Wiltse. |
| U. S. S. | Charleston | Geo. C. Reemey. |
| U. S. S. | Chicago | H. B. Robeson. |
| U. S. S. | Despatch | W. S. Cowles. |
| U. S. S. | Dolphin | Yates Stirling. |
| U. S. C. S. | schr. Eagre | W. P. Elliott. |
| U. S. C. S. | schr. Earnest | J. N. Jordon. |
| U. S. S. | Enterprise | G. A. Converse. |
| U. S. C. S. G. S. | Blake | C. E. Vreeland. |
| U. S. C. S. | Gedney | J. M. Helm. |
| U. S. S. | Independence | Byron Wilson. |
| U. S. S. | Jamestown | B. P. Lambertson. |
| U. S. S. | Kearsarge | H. Elmer. |
| U. S. C. S. S. | McArthur | W. P. Ray. |
| U. S. S. | Mohican | E. M. Shepherd. |
| U. S. S. | Portsmouth | J. Schouler. |
| U. S. S. | Richmond | O. F. Stanton. |
| U. S. S. | San Francisco | W. T. Sampson. |
| U. S. S. | Swatara | P. H. Cooper. |
| U. S. S. | Thetis | C. H. Stockton. |
| U. S. S. | Yantic | C. H. Rockwell. |
| U. S. S. | Yorktown | F. E. Chadwick. |
| | *Sailing vessels.* | |
| Am. schr. | Anna E. Kranz | P. F. Terentieff. |
| sp. | Alex. Gibson | I. N. Hubbard. |
| Ger. bk. | Antares | H. Rahen. |
| Dtch. bk. | Ardjoeno | D. Bakker. |
| Am. sp. | Almeda | O. E. Chapman. |
| Br. bk. | Argyle | C. O. Allen. |
| | Aquatic | L. A. Halorow. |
| sp. | Ardencraig | F. G. Hampshire. |
| Br. bkt. | Antilla | J. W. Jones. |
| Am. bg. | Arcot | J. W. Cates. |
| Belg. bk. | Brabant | S. Gercles. |
| Br. bk. | Brazil | H. Davison. |
| sp. | Brenda | W. L. Roperet. |
| | British Isles | W. Thompson. |
| | British Merchant | E. I. Molony. |
| It. bk. | Bartholomeo Gagliardo | F. Sanjuineti. |
| | Battastina | F. Olivar. |
| Am. | Columbian | W. G. Goodman. |
| Br. sp. | Chas. S. Whitney | Geo. D. Spicer. |
| | Cape of Good Hope | C. McLeod. |

| | Name of vessel. | Captain. |
|---|---|---|
| Ger. bk. | Charles Luling | C. Wiche. |
| Br. sp. | Craigend | J. Hamilton. |
| schr. | Calabria | J. T. Palmer. |
| Am. sp. | Conqueror | W. A. Lathrop, Jr. |
| Br. bg. | Clyde | E. Strum. |
| | Champion | Thos. Wood. |
| sp. | Darpool | T. C. Flaron. |
| — schr. | Edith L. Allen | D. B. Darrah. |
| Swed. sp. | Edward | E. Akermark. |
| Br. bk. | Endora | — Lewis. |
| Am. schr. | Fostina | R. Philbrook. |
| sp. | Francis | A. Doane. |
| It. bk. | Gemma | B. Vencenzo. |
| Am. schr. | Geo. V. Jordan | E. V. Lyman. |
| | Gertrude Summers | B. W. Latham. |
| bk. | Grace Deering | J. A. Meech. |
| Br. bg. | Harry Stewart | J. G. Briston. |
| Am. bk. | H. B. Hussey | G. W. Hodgdon |
| Ger. sp. | Hermon | O. Olsen. |
| Br. | Hilaria | S. W. Dick. |
| Am. schr. | Howard B. Peck | A. Mehaffey. |
| Br. sp. | Jane Burrell | W. B. Robertson. |
| | Jason | D. McGior. |
| Am. schr. | J. C. Ford | W. H. Mercer. |
| — schr. | Joseph Souther | W. G. Keene. |
| Br. sp. | Julien | E. Groningen. |
| Port. bk. | Julius | F. D. Vieira. |
| Ger. | Jupiter | F. Gerlach. |
| Br. | Konoma | J. Thompson. |
| Am. bg. | L. F. Munson | J. V. McKowen. |
| Am. sp. | Light vessel No. 45 | Andrew Jackson |
| | L. J. Morse | R. C. Clapp. |
| Br. sp. | Lonsdale | G. Buckingham. |
| bg. | Marianna Pope | R. Oughterson. |
| Nor. bk. | Martin Luther | F. L. Gronneberg. |
| Am. — | Mary Adelaide Randall | J. L. Randall. |
| bk. | M. J. Foley | R. H. Cox. |
| Span. sp. | Nautilus | V. V. Concas. |
| Am. schr. | Nelson Bartlett | J. W. Watts. |
| bk. | Neptune | J. F. Hall. |
| | Nereid | H. A. Clifford |
| Br. bk. | Parsee | J. P. Cowen. |
| It. bk. | Peppina | S. Fannello |
| Am. schr. | Phebe | M. Menden. |
| Ger. bk. | Pillan | G. Gerlach. |
| It. | Principe de Napoli | G. Francesco. |
| Nor. | Qvos | G. Olsen. |
| Br. sp. | Rahane | E. J. Pasifall. |
| Am. schr. | R. F. Pettigrew | R. Morse. |
| | Roger Drury | John Delay. |
| Nor. bk. | Rolf | T. Torgensen. |
| Br. | Salina | J. Peterson. |
| sp. | Sapphire | G. W. Murray. |
| Am. bk. | Sarah | L. R. Hale. |
| Br. sp. | Semantha | L. C. Dart. |
| | Servia | E. M. Smith. |
| It. bk. | Silenzio | A. Darpelo. |
| Br. sp. | Thessalus | J. Henderson. |
| — | Trojan | J. J. Doyle. |
| Am. bk. | Tillie Baker | J. N. McCarty. |
| It. | Vittoria | B. Scarpati. |
| Am. | Wakefield | B. C. Howes. |
| bkt. | White Wings | R. E. M. Davison. |
| sp. | Wm. J. Rotch | S. L. Bray. |

*List of voluntary observers of the Signal Service, etc.*—Continued.

**Foreign.**

Prof J Bolam
Govt Naviga School
14 Dock Place
Leith Scotland

Dr C F Hering
Burnside (Coronie)
Colony of Surinam
Dutch Guiana S A

G J Gibbs
Grand Turk
Turks Islands Brit W I

Director
Meteorological Obs'y
Guanajuato Mexico

Gen Russell Hastings
Hamilton Bermuda

Prof M Leal
Leon
Guanajuato Mexico

Director
Astro and Met'l Obs'y
Mazatlan Mexico

Director Cen Met Obs'y
City of Mexico Mexico

George Matson
Topolobampo
Sinaloa Mexico

Prof C H McLeod
McGill College Obs'y
Montreal Canada

Capt Adolphus Peele
New Westminister
British Columbia

Prof P Scherer
Meteorological Obs'y
Port au Prince Hayti

Director Catholic Institute
Pueblo Mexico

Director Institute de
Ciencias del Estado de
Zacatecas Mexico

H Patrick
La Logia
Sinaloa Mexico

J Higgins
Saint Johns Newfoundland

Curtis J Lyons
Honolulu
Hawaiian Islands

Rafael Junquera
Santiago de Cuba

G Murdock
St Johns
New Brunswick

Dr Enrique del Monte
Office of Astro & Met
Havana Cuba

Jos Ridgeway
St Thomas Dutch W I

E Baynes Reed
Esquimault B C